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INFORMAL REPORT

OCEANOGRAPHIC DATA REPORT  
SAN CLEMENTE ISLAND AREA  
OCTOBER TO DECEMBER 1966

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SEPTEMBER 1967

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## INFORMAL REPORT

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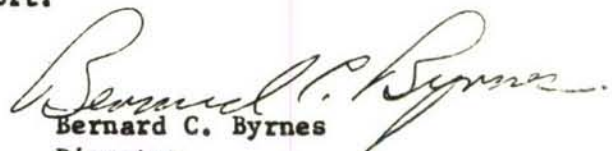
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# ABSTRACT

This report presents sediment, deep towed profiler, physical oceanography, visibility, and current data collected in the San Clemente Island Test Range from October to December 1966 aboard the USNS DAVIS (T-AGOR 5). The sediments vary in size from clays to sand and the bearing strength ranges from  $0.8 \text{ g/cm}^2$  near the tops of several cores to  $58.7 \text{ g/cm}^2$  for near the bottom of one of the longer cores (80 - 87cm interval). The deep towed profiler traces show hillocks six feet in height and subbottom reflecting layers from 3 to 50 feet below the sediment surface. Sea water temperature values range from  $18.5^\circ\text{C}$  at the surface to  $2.85^\circ\text{C}$  at 1483 meters depth in San Clemente Basin. Minimum sound velocity values for the area occur between 700 and 800 meters depth. Alpha values for the water column range from  $0.03 \text{ ln/m}$  (150-200 meters depth) to  $0.28 \text{ ln/m}$  (30-40 meters depth). This represents visibility ranges from about 130 meters to 14 meters respectively. Tidal forces appear to exert an influence on the current regime to the greatest depth measured (1829 meters). Current speeds for the water column range from zero to about 1.5 knots with rotary direction vectors. Instrumentation development pertinent to the survey is also discussed. Conclusions reached in this report are tentative based on the limited amount of survey data available. More seasonal investigations of the currents, temperature, and visibility, and more detailed measurements of sea floor topography and sediments are essential in order to clearly define the oceanographic environment.

This Manuscript has been reviewed and is approved for release as an UNCLASSIFIED Informal Report.

  
Bernard C. Byrnes

Director

Developmental Surveys Division



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## I. INTRODUCTION

### General

From October to December 1966, the Bottom Environmental Survey Project (BESP) of the Naval Oceanographic Office (NAVOCEANO) conducted an oceanographic environmental survey in the vicinity of San Clemente Island. The purpose of the survey was to obtain oceanographic information for the support of the Deep Submergence Systems Program (DSSP).

Messrs. R. K. Oser and R. P. Kopenski were NAVOCEANO Project Leaders. They were assisted by Messrs. J. H. Rohrhirsch, J. Frankel, R. S. Rushton, K. M. Olson, M. G. Fagot, J. L. Berger, M. Car, J. D. Hawes, W. Carriker, and A. R. Mooney.

### Operations

The survey was conducted aboard USNS CHARLES H. DAVIS (T-AGOR 5) (Figure 1) from 11 October to 12 December 1966. Observations were made in two areas designated Area I and Area II. Area I borders the northeast side of San Clemente Island and Area II, about 12 miles square, is located in the San Clemente Basin (Figure 2). The observations and instrument tests made were as follows:

- 64 Kullenberg and Boomerang Cores
- 35 Ramsay probes (temperature, sound velocity, depth)
- 9 Nansen casts
- 6 Taut-wire current meter sites (arrays)
- 52 Miles of Deep Towed Profiler (DTP) track



18 Camera/visibility lowerings (36 hours). Results to be published separately.

13 Transmissometer lowerings

1 Bottom transmissometer drift (5 miles)

9 K-Meter lowerings

1 Test lowering of 16-inch diameter Corning glass spheres to 560 fathoms

1 Test firing of IEC explosive cutter on 9/16 inch diameter nylon line at 40-foot depth

1 Test firing of IEC explosive cutter on 1/2 inch wire cable at 3900-foot depth

### Data

Original records for most of the data are retained by NAVOCEANO. Transmissometer lowerings, K-meter, and bottom transmissometer drift data are retained by the Naval Undersea Warfare Center (NUWC), Pasadena, California. Copies of the transmissometer data were given to the NAVOCEANO Project Leaders after completion of the survey.



FIGURE 1. USNS CHARLES H. DAVIS (T-AGOR 5).

U.S. NAUTIC RESEARCH SHIP  
 AGOR 5  
 William Christy Corporation  
 200 Bay, Wisconsin  
 1967



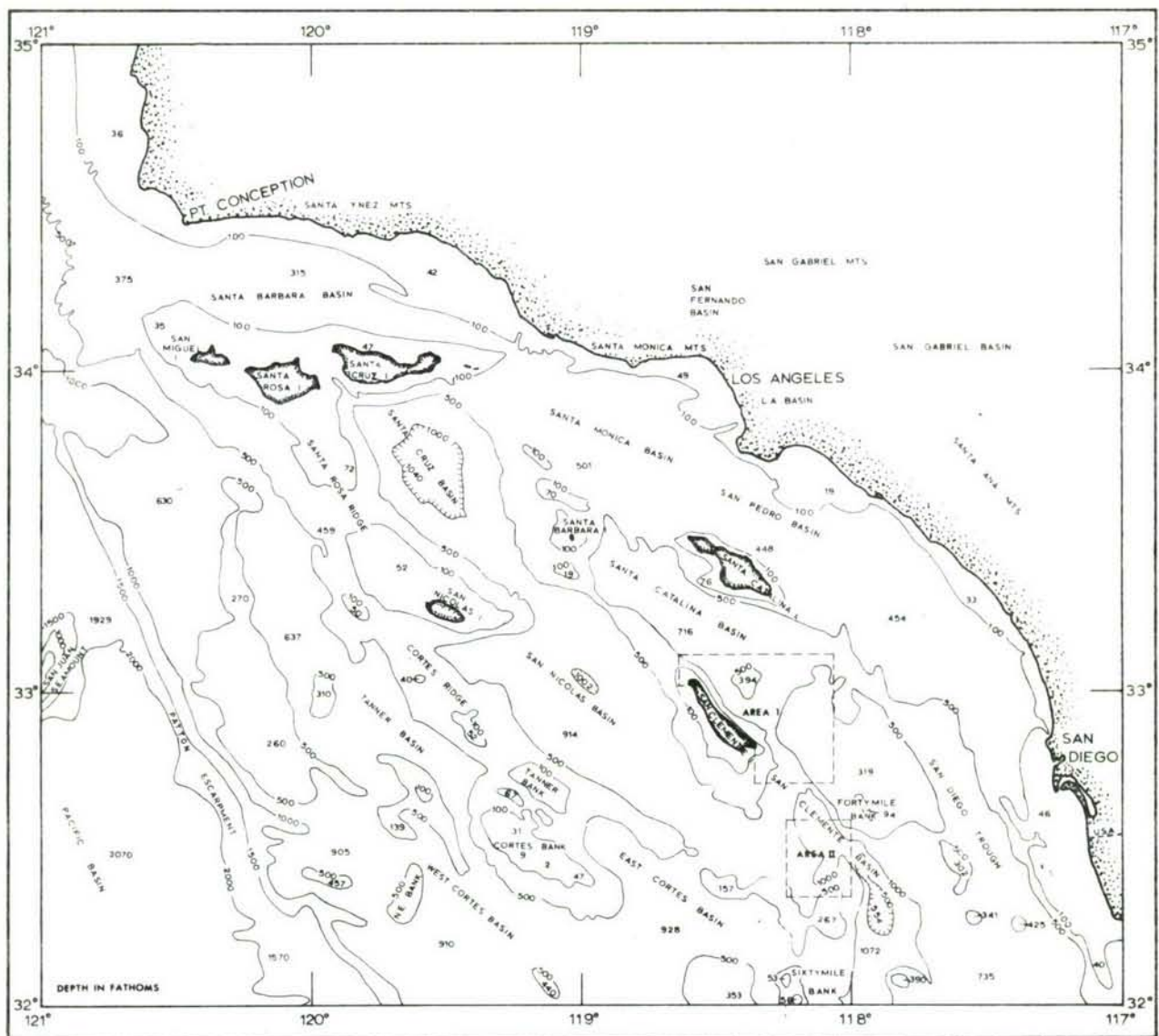


FIGURE 2. BATHYMETRY OF THE CONTINENTAL BORDERLAND.

## II. GEOLOGY

### General

The great majority of the world's continental land masses are bordered by gently sloping marine terraces termed continental shelves. These shelves encompass the area from the low water tidal mark seaward as much as 200 miles to the edge of the steep continental slope. Continental shelves are generally relatively flat features exhibiting only minor relief. In the vicinity of San Clemente Island and off the southern California coast, this is not the case. Here the shelf has a complex topography consisting of deep basins and high, steep-walled blocks (Figure 2).

To distinguish the physiography of this marine basin and range province, which is topographically similar more to the contiguous land area than to the continental shelf it represents, the term "continental borderland" has been applied by Shepard and Emery (1941). The borderland extends seaward approximately 140 miles and is terminated by the steep Patton Escarpment which slopes down to the Pacific Basin. The northern limit of the continental borderland is near Point Conception, California. North of the Point, the shelf is typically flat. The borderland area consists of a series of northwest-southeast striking islands, ridges, basins, and troughs that are truncated by steep, rocky fault escarpments.

### Geomorphology

Area I is adjacent to the northeast side of San Clemente Island and consists of three distinct geomorphic features - the southern part of the Santa Catalina Basin, a prominent subsurface dome, and the San Clemente Escarpment (Figure 3). The basin is a structural feature bounded on the north and south by the steep fault scarps adjacent to San Clemente and



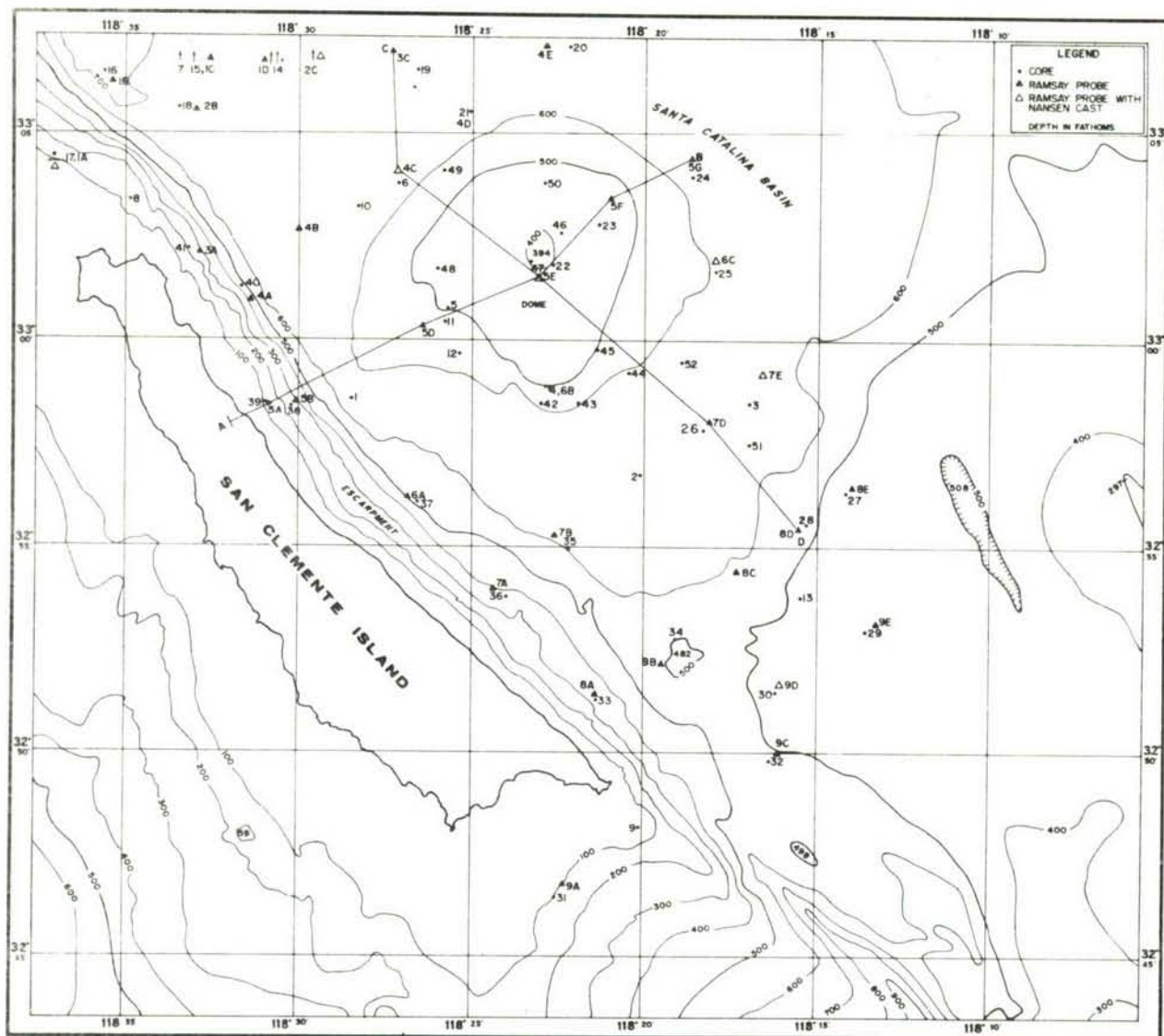


FIGURE 3. STATION LOCATIONS—AREA I.

Santa Catalina Islands (Plate I). The basin is relatively flat because of filling and leveling by organic debris and by clastic sediments borne outward from the mainland. In Area I the basin has a maximum depth of about 700 fathoms. Approximately 8 miles northeast of San Clemente Island, a prominent near circular, subsurface dome disrupts the otherwise nearly flat basin plain. The structure is approximately 8 miles across at its base and rises at an average gradient of  $4^{\circ}$  from a maximum depth of 600 fathoms to a minimum depth of 394 fathoms (Figures 3 and 4). The San Clemente fault scarp which forms the steep northeast slope of the island continues from sea level to the basin floor. This rocky linear feature has an average gradient of about  $17^{\circ}$  along its island portion.

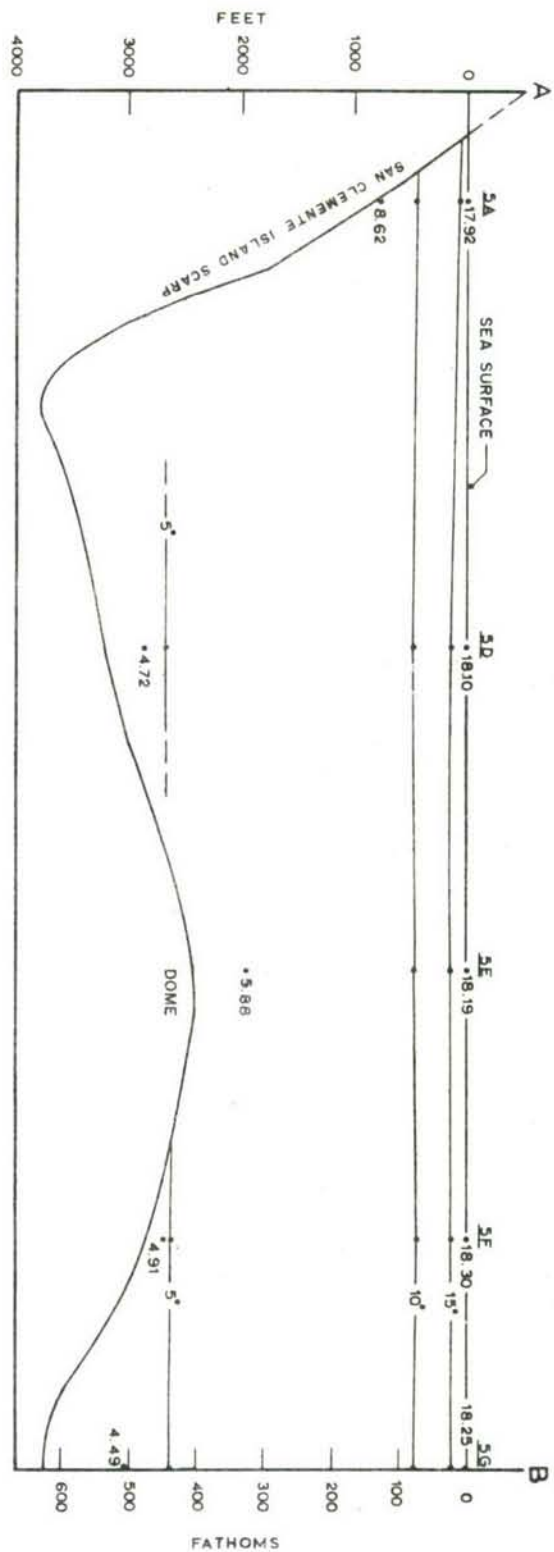
Area II is located within the confines of San Clemente Basin which is situated between 15 and 70 miles southeast of San Clemente Island. This basin is considerably deeper than the Santa Catalina Basin (Figure 5). The marked difference in depth is a function of the availability of terrigenously derived sediments. The eastern side of San Clemente Basin is bordered by Forty Mile Bank which rises to within 43 fathoms of the surface. This topographic high serves as an effective block to the sediments derived from the mainland. Because of the relative paucity of detrital material, the floor of San Clemente Basin is deep and irregular.

#### Sediment Characteristics

According to Emery (1952) the groups of shelf sediments found within the continental borderland off southern California are:

- a. Authigenic - Composed of glauconite and phosphorite
- b. Organic - Consisting of foraminifera tests and shells
- c. Residual - Consisting of material weathered from underlying rock





# ISOTHERMS (C°)

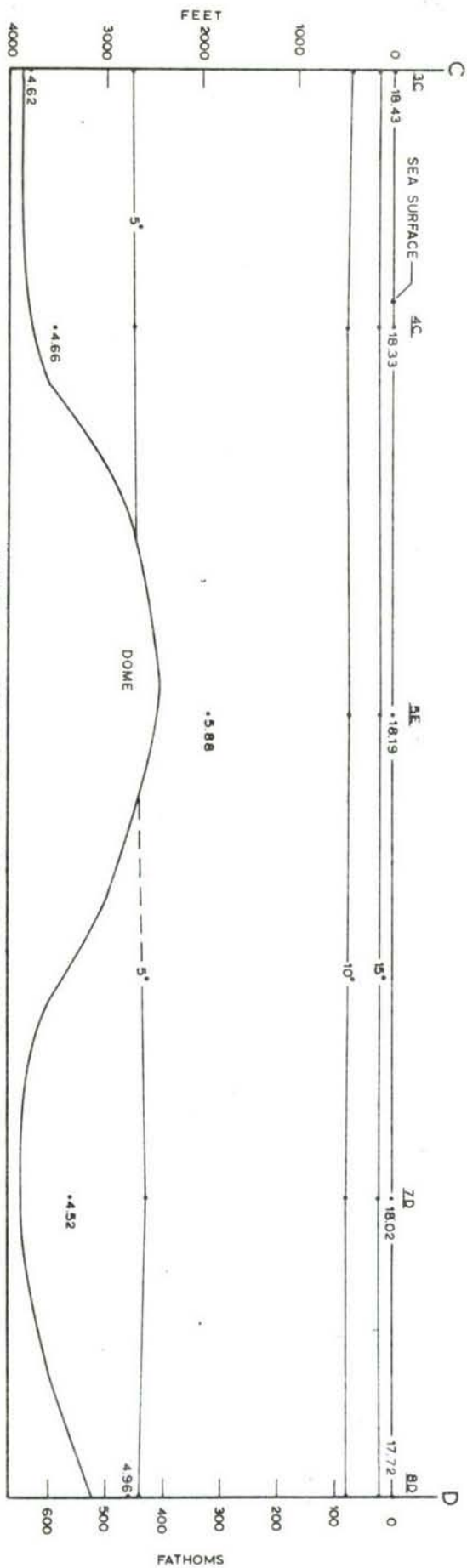


FIGURE 4. CROSS SECTIONS THROUGH DOME—AREA I.

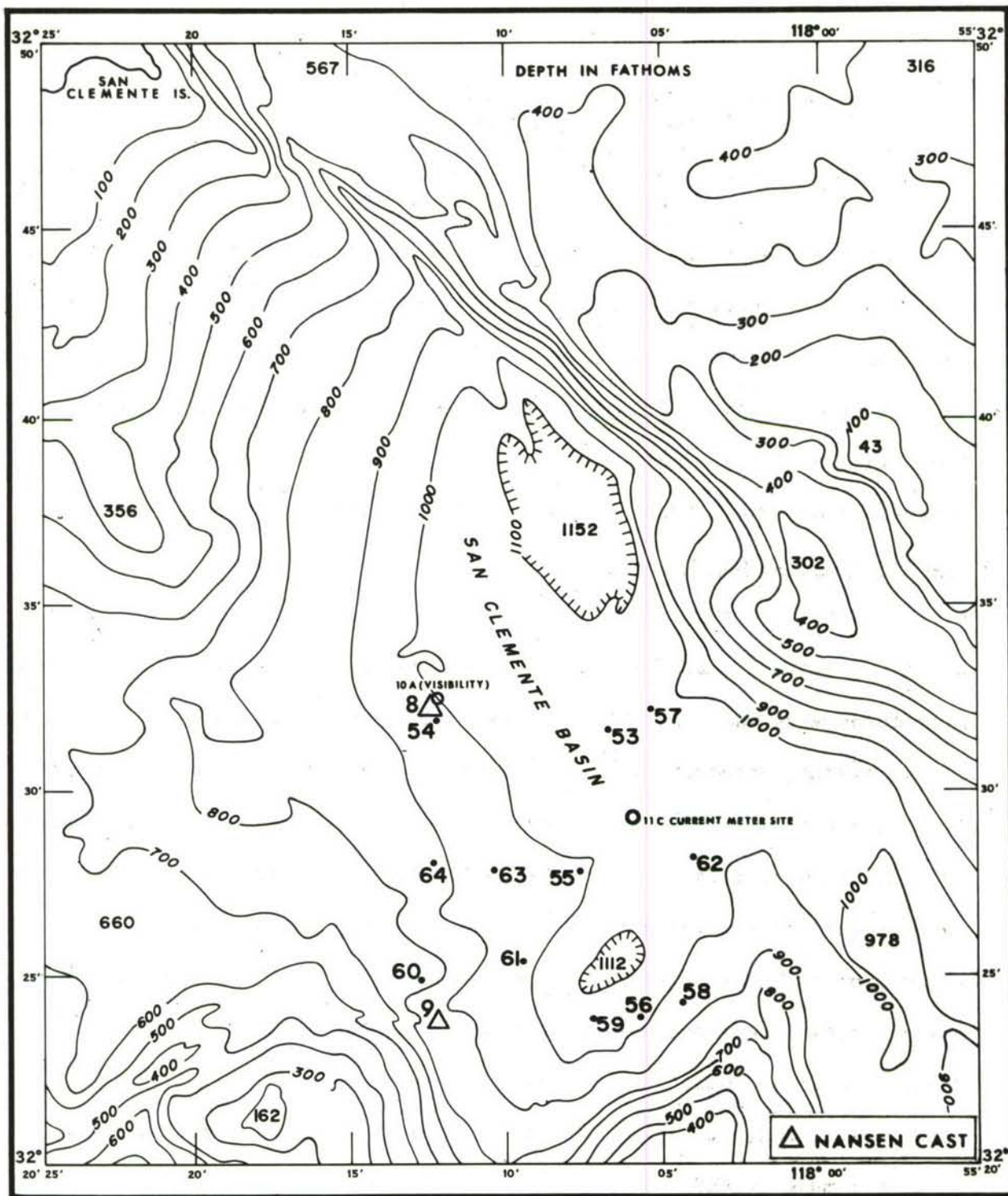


FIGURE 5. STATION LOCATIONS AND BATHYMETRY—AREA II.



d. Relict - Consisting of sedimentary remnants from an earlier geologic environment

e. Detrital - Consisting of clastic sediments derived from river mouths, beaches, and sea cliffs

Of these five sources, Revelle and Shepard (1939) have indicated that sediments of stream derivation are the most important source of depositional material in the continental borderland. During periods of flooding, streams and rivers of southern California carry sediments to the sea. Ocean currents then disperse the sediments over the borderland. Topographic highs of the borderland are swept free of fine sediment by ocean currents.

#### Methods and Procedures

In Area I, cores were obtained with both the Kullenberg and Boomerang coring devices. In Area II, only the Kullenberg corer was used. Standard procedures were used for obtaining and preserving the samples for analysis of engineering properties. Figure 6 shows a Precision Graphic Recorder (PGR) trace of a corer being lowered at station 14. The signal was emitted by a 12 KHz pinger fastened to the cable above the corer. Analyses of core samples for engineering properties were made as soon as possible after collection to insure against erroneous results owing to dehydration and disturbance. These analyses were made at the NAVOCEANO Pacific Support Group, San Diego, California. The cores were analyzed at the geology laboratory, NAVOCEANO, for grain size distribution. Further analyses of the data were made by BESP.

#### Analysis and Results

Sediment types for Areas I and II are shown in Figure 7 and the data sediment characteristics are presented in NAVOCEANO Laboratory Item No. 303, "A Summary of Engineering Properties, Sediment Size, and Composition Analysis of Cores from the Continental Borderland Near San Clemente Island, October

9 Nov '66  
400-800 fathoms  
ORE PINGER  
15' TRIP-ARM  
STA # 1d  
2'8" CORE

20 fathoms

CORER

CORER ON  
BOTTOM  
PINGER  
SHUT OFF

BOTTOM

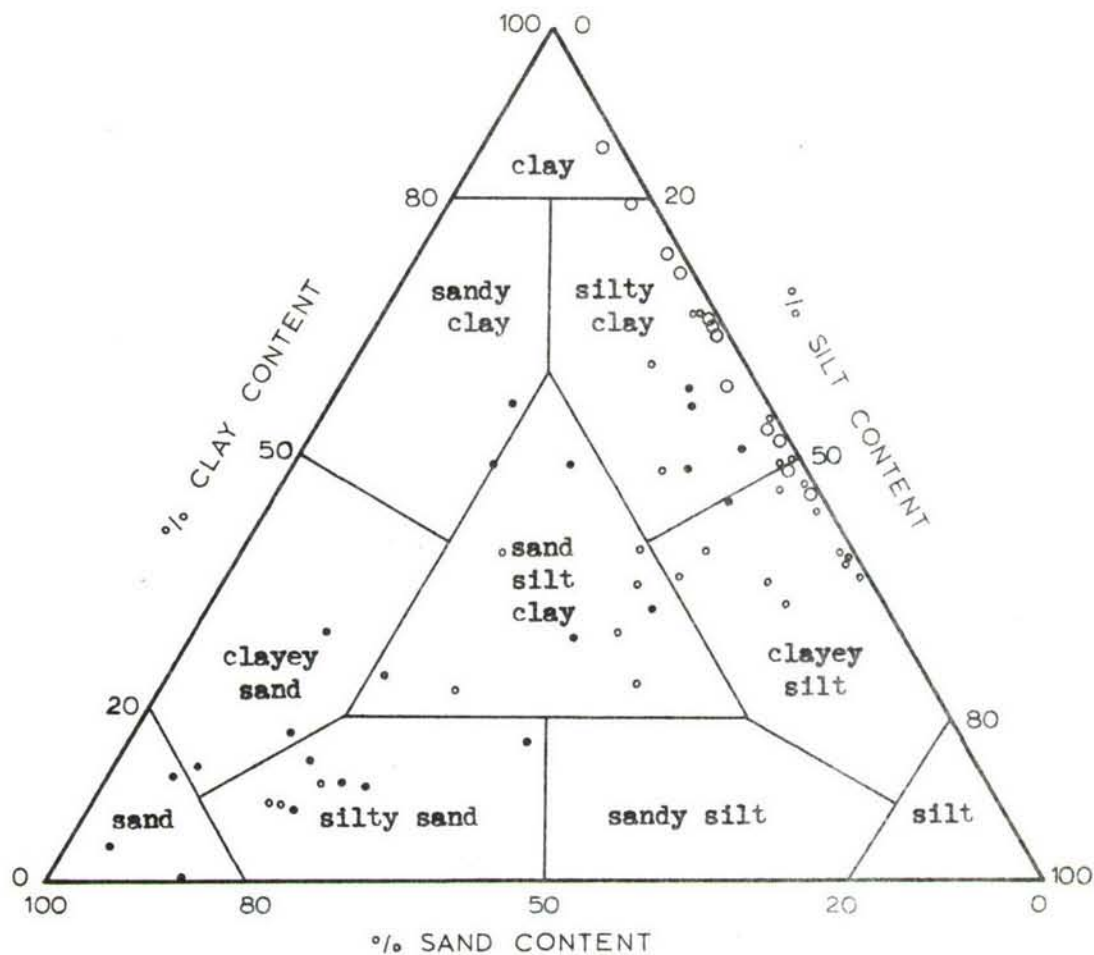
DIRECT SIGNAL

REFLECTED SIGNAL

DEPTH: 679 FATHOMS

CORER  
OFF BOTTOM  
PINGER CUT-ON

FIGURE 6. PINGER RECORD—CORE 14.



- Area I basin sediments
- Area I scarp and dome sediments
- Area II basin sediments

FIGURE 7. NOMENCLATURE OF SEDIMENT TYPES—AREAS I AND II.  
( After Shepard, 1954, p.157)



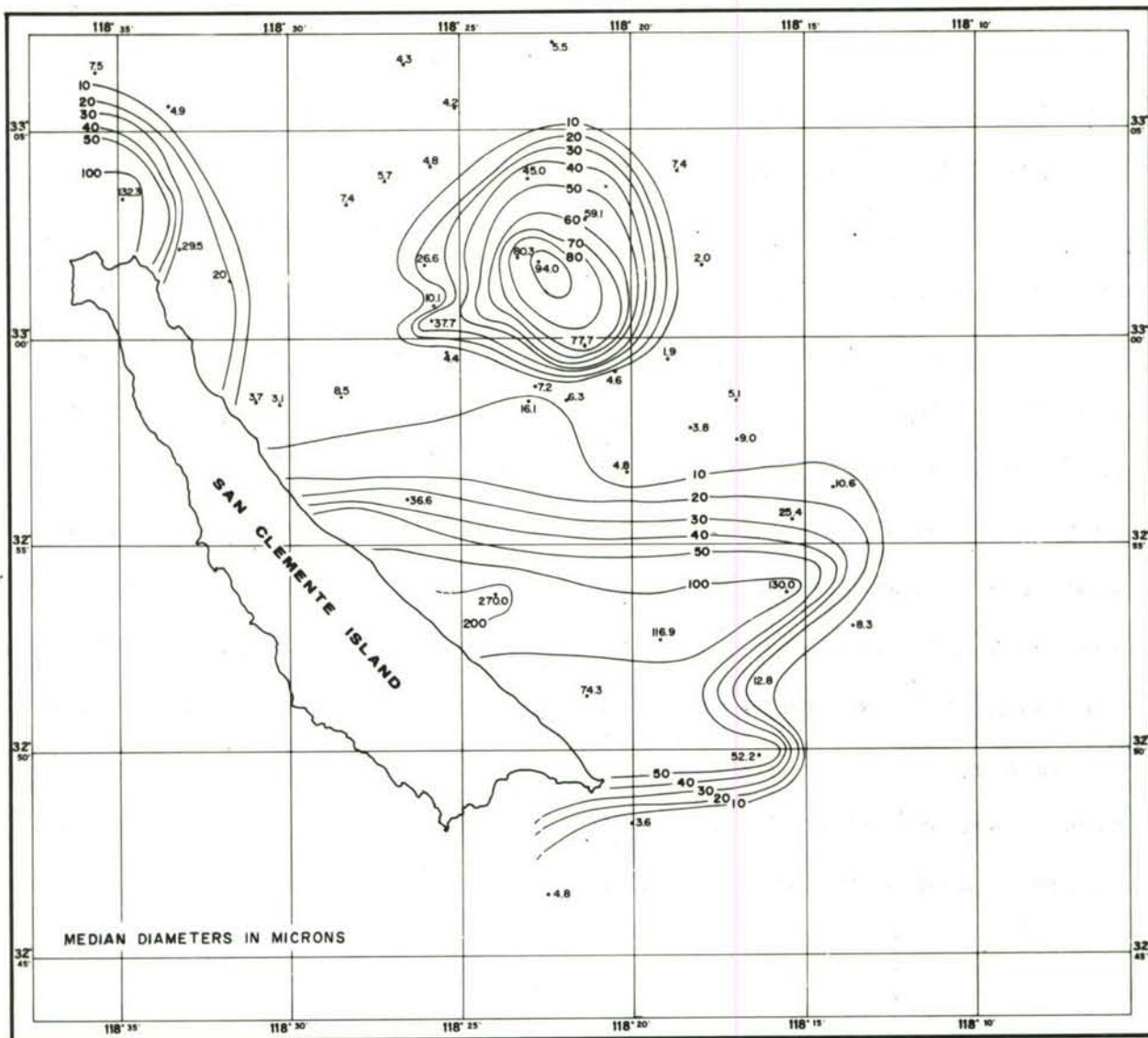


FIGURE 8. ISOPLETHS—MEDIAN DIAMETERS OF SURFACE SEDIMENTS—AREA I.

1966-December 1966. The types of sediments (Figure 7) are based only on analyses of cores obtained during the survey.

The San Clemente Island scarp is mantled by a sand and gravel veneer with interstitial silt and clay. The sediment is predominately residual although aerial erosion of the island and shells of marine organisms have contributed significantly to the material. Figure 8 shows median diameter contours in microns of the surface sediments in Area I. The high concentration of coarse sediments along the eastward flank of the island occurs along the highest and steepest part of the island scarp. It is likely that the tongue of coarse material which extends from the water line outward onto the basin floor is a function of subaerial erosion of the island scarp.

In Area I, basin sediments consist mostly of olive-gray, clayey silts with lesser amounts of interspersed foraminiferal-test sand. In addition, layers of sand up to several inches thick were found. These strata are

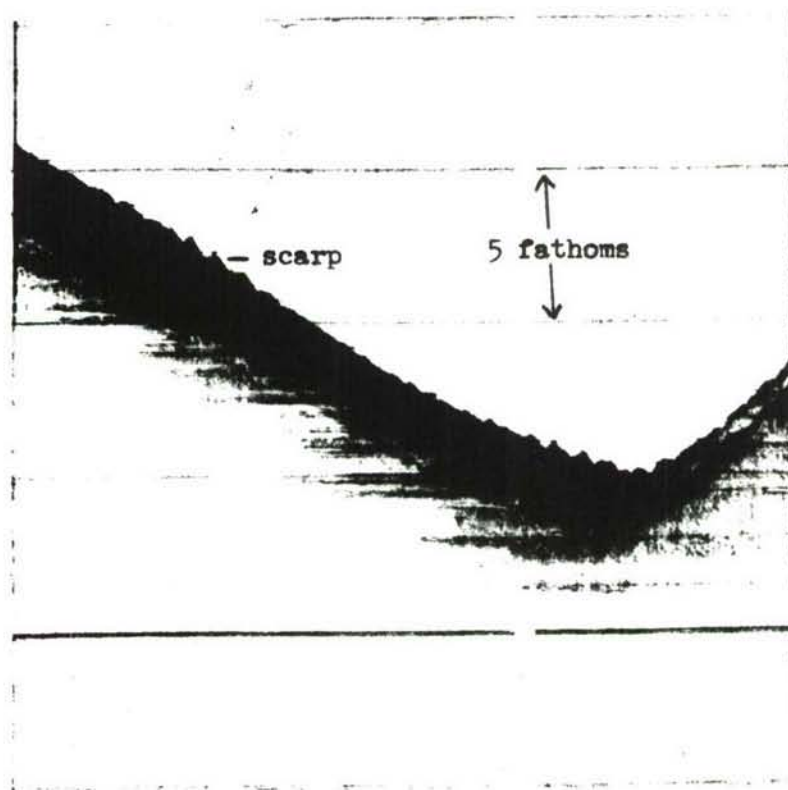


FIGURE 9. DTP RECORD—SUBBOTTOM STRATA—BASE OF SCARP.

attributed to sediment slumping and/or turbidity currents that were initiated on the steep island scarp and subsurface dome. The material at the bottom of the slope has settled out as a function of density. The depositional sequence began with sand on the bottom, grading upward to silts and clays. Figure 9 shows several of the sand strata at the base of the San Clemente scarp.

The sediment on the dome differs substantially from the material on the adjacent basin floor. Above the 500 fathom contour, the samples were predominately sand with lesser amounts of gravel, silt, and clay. This was substantiated in Area I, where extensive coring attempts on the escarpment and dome yielded small quantities of sediment, and by the core cutters that were scored as a result of hitting rock. The topographic lows, and in particular the basins of the area, are the recipients of the finer clastics. The submerged topographic highs are mantled with coarser residual and relict sediments.

In Area II, sediments consist of olive-gray, silty-clay with only traces of foraminiferal sand. Laboratory analysis has shown the  $\text{CaCO}_3$  constitutes from 13 to 48 percent of the sample weight. Traces of mica were also found.

#### Engineering Properties

Bearing strength of sediments is defined as the average load per unit area (grams per square centimeter) required to produce failure, by rupture, of the supporting sediment mass. The uppermost bearing strength tests (vane shear) were usually conducted at the 15-centimeter core depth. The sediment above this level was usually of a fluid consistency and could not accurately be analyzed for bearing strength.



In Area I the sediment bearing strength values for the 15-22cm core interval range from 5.0 to 38.7 g/cm<sup>2</sup> with an average value of about 9 g/cm<sup>2</sup>. The dome appears to consist of rock outcrops and sand which would have a higher bearing capacity than the basin floor sediments. Samples obtained near the top of the dome and on the scarp consisted of small amounts of unconsolidated sand. No engineering tests were made on these samples. In Area II the values range from 0.8 to 22.0 g/cm<sup>2</sup> for the 15-22cm interval with an average value of about 7 g/cm<sup>2</sup>. The overall strength of the sediments increases almost linearly from top to bottom of the cores. The strengths average 28 g/cm<sup>2</sup> in Area I and 19 g/cm<sup>2</sup> in Area II for the 65-72 core interval. Figure 10 shows plots of bearing strength versus core interval for six typical core samples of Areas I and II.

The average length of cores from the basin in Area I was less than that of cores from Area II. This was attributed to the presence of a very dry and dense sediment layer occurring at various depths within the sediments in Area I. The extreme hardness of the layer was such that a 425 pound corer, falling at terminal velocity, failed to penetrate the layer more than several inches in most instances.

An important feature of the engineering properties of sediments is sensitivity. Sensitivity is defined as the ratio of the natural strength of a sample to the remolded (disturbed) strength of sample. The average sensitivity of the core samples was about 2.0 which indicates that the sediment when disturbed and remolded lost about 50 percent of its original undisturbed strength. Sensitivity values range from 1.1 to 24.8 with most values grouped near 2.0 (NAVOCEANO Lab. No. 303).

#### High Resolution Profiling

A Deep Towed Profiler (Figure 11) which was designed in-house (NAVOCEANO IM NO. 67-12) was towed in Area I as shown in Figure 12. Records obtained

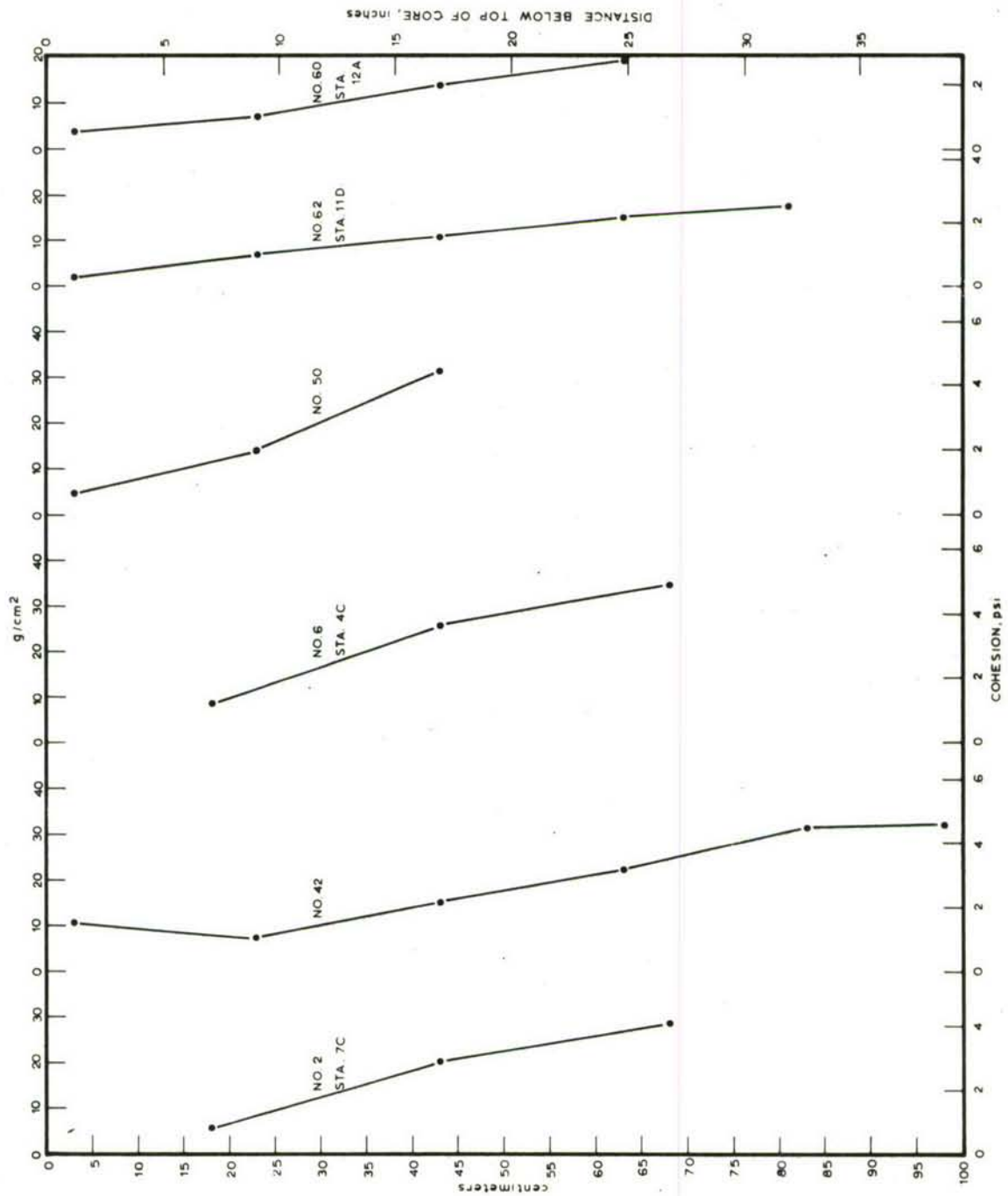


FIGURE 10. BEARING STRENGTH VERSUS DEPTH—TYPICAL CORES.

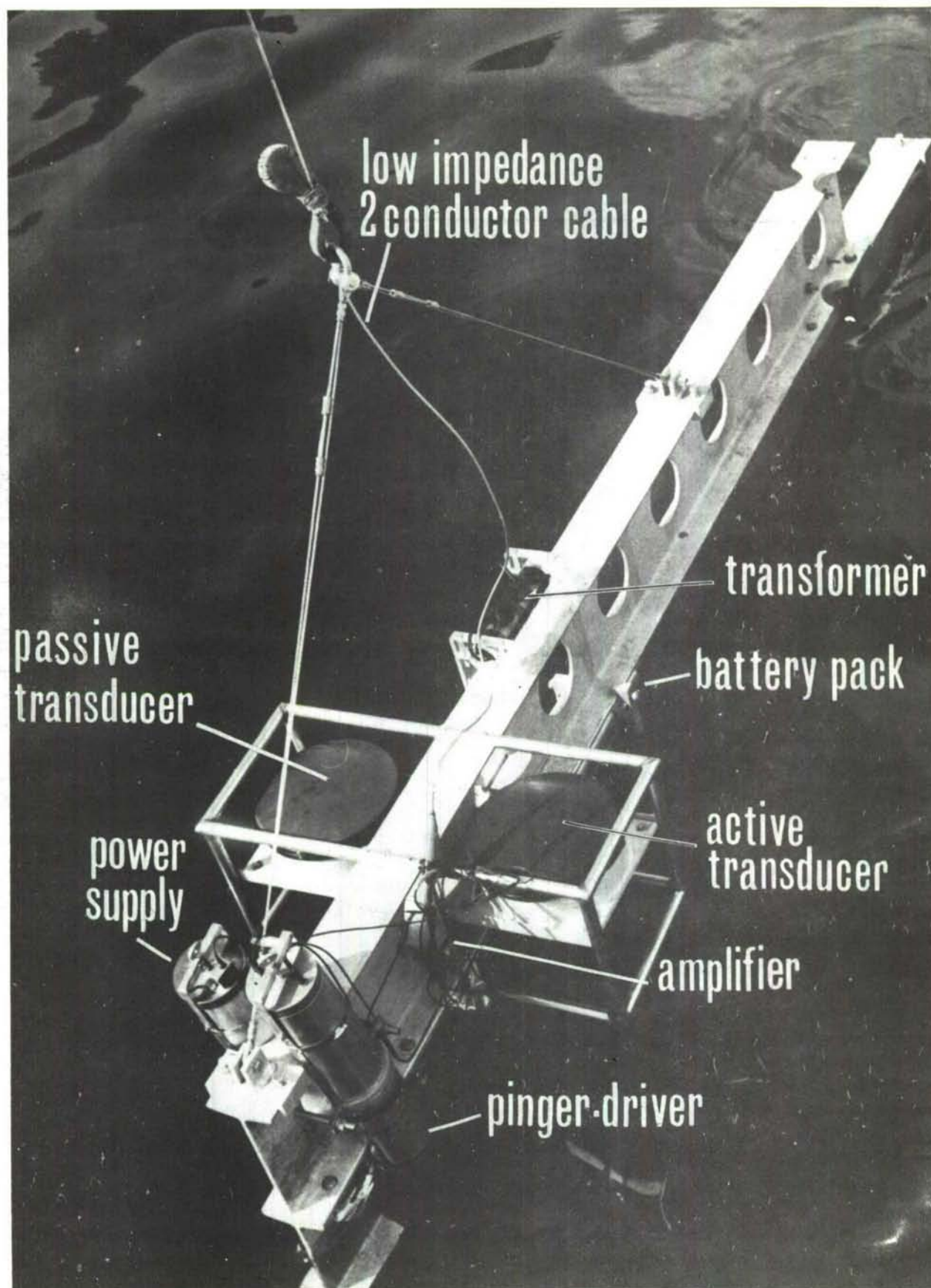


FIGURE 11. DEEP TOWED HIGH RESOLUTION PROFILER (DTP).



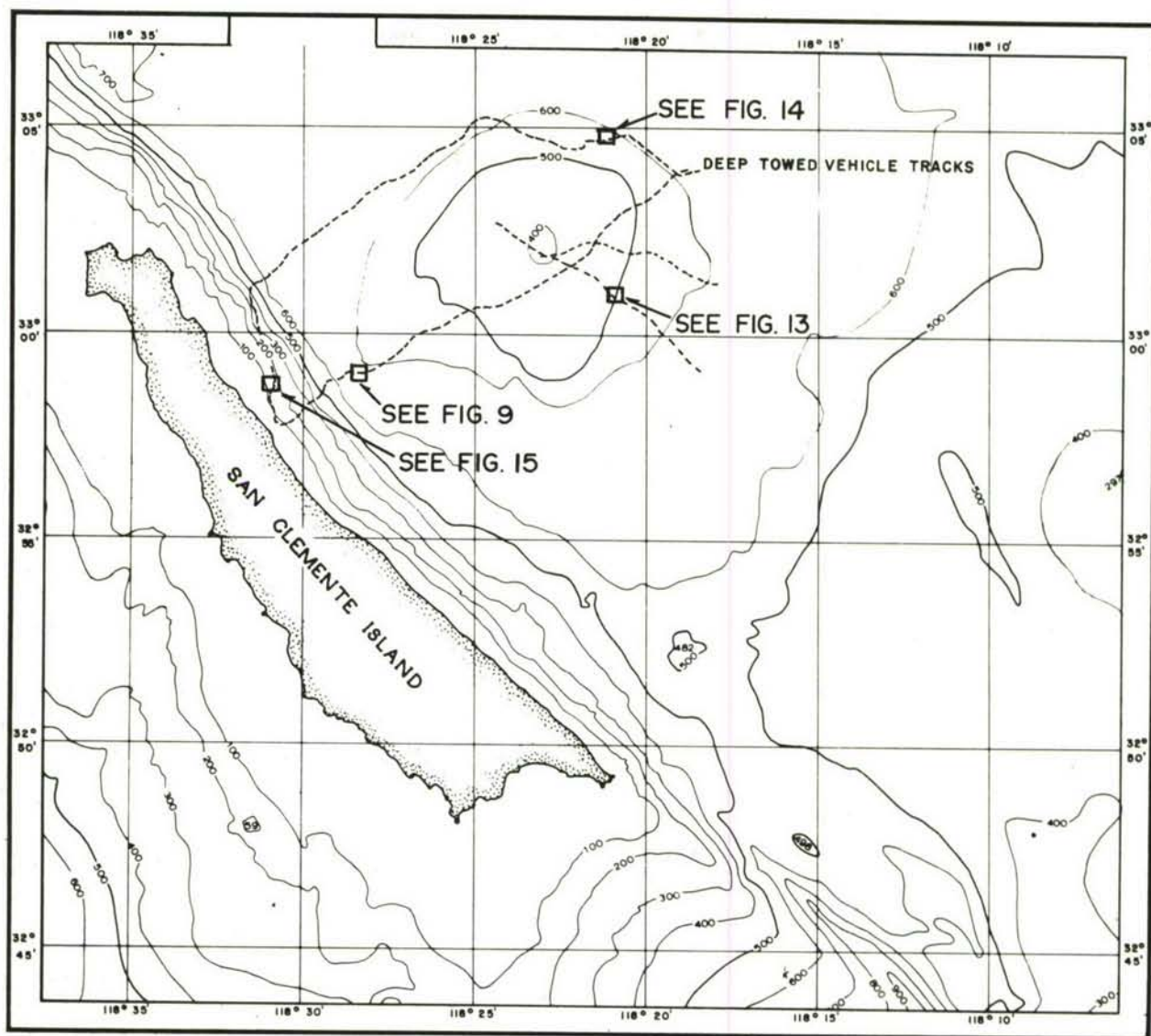


FIGURE 12. DTP TRACK CHART.

while towing the DTP across the dome showed a relatively smooth bottom with no subbottom reflectors above the 500 fathom contour. Near the top, small hills are superimposed on the dome. These features are 6 to 50 feet in height and were detected only near the top of the dome. Traces of the bottom below the 500-fathom isobath of the dome and the basin floor show a generally smooth bottom with from one to three subbottom reflecting layers. These reflectors occur between 3 and 50 feet below the sediment surface.

Small hillocks are shown in Figure 13. These hillocks which are on the southeast flank of the dome are approximately 12 feet high and are 400 feet long. The bottom shown to the left of the hillocks has a subbottom reflecting layer several feet below the sediment surface. The hillocks appear to have no stratification and are probably rock outcrops. The bottom in Figure 14 on the northeast flank of the dome shows substantially more subbottom stratification than on the southeast flank. The signal penetrated the bottom to depths in excess of 30 feet. Two strong subbottom sonic reflecting layers, their thicknesses, and changes in slope are shown.

The sharply defined bottom trace shown in Figure 15 was obtained while towing the fish up the San Clemente Island escarpment. Here the bottom is composed of solid rock with a veneer of fine material. Near the bottom of the escarpment approximately six, thin reflectors are present (Figure 9). These strata are a result of sediment slumping and/or turbidity currents that initiated on the escarpment.

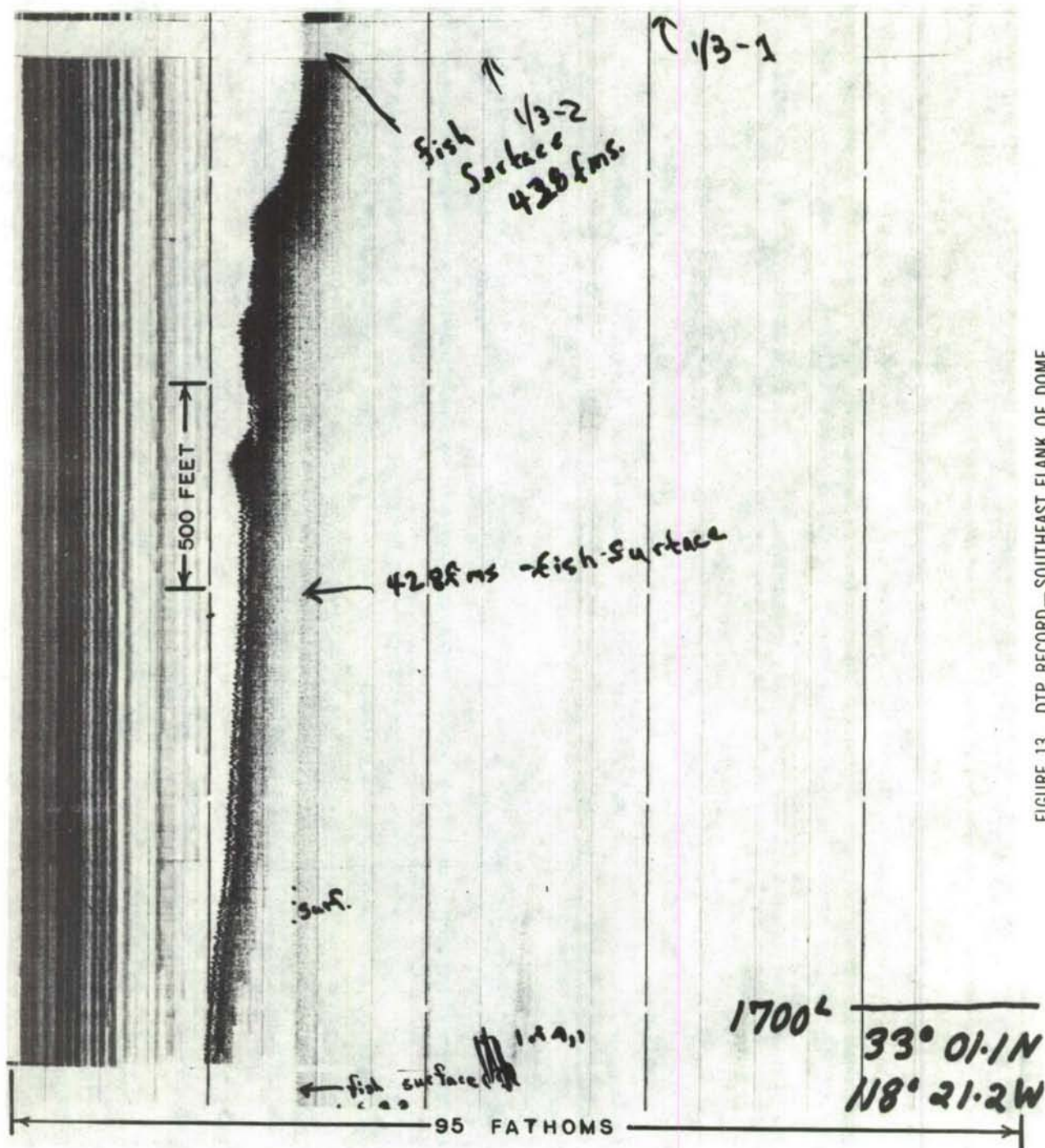


FIGURE 13. DTP RECORD—SOUTHEAST FLANK OF DOME.



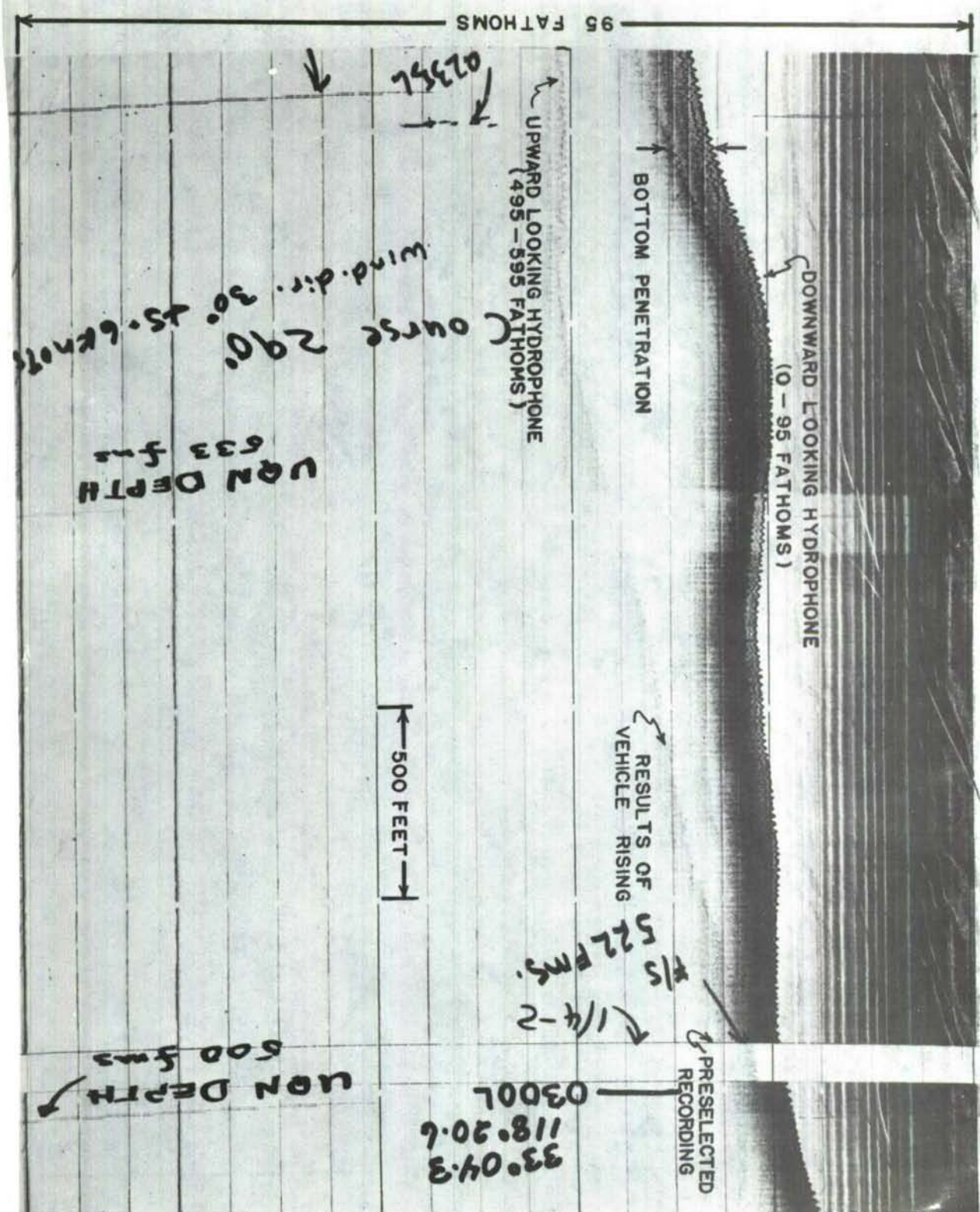


FIGURE 14. DTP RECORD—NORTHEAST FLANK OF DOME.

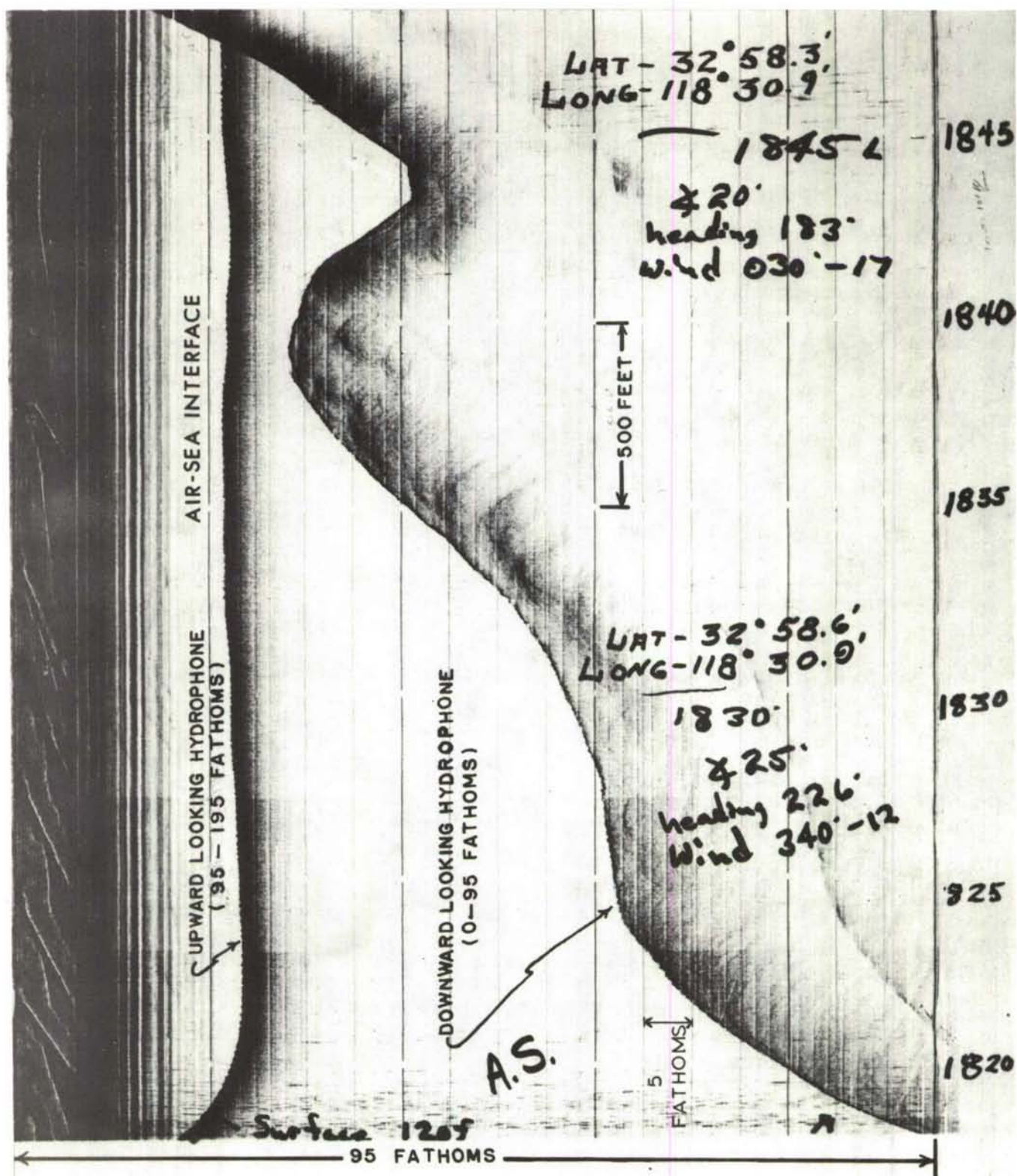


FIGURE 15. DTP RECORD—SAN CLEMENTE ESCARPMENT.



### III. PHYSICAL OCEANOGRAPHY

#### General

Numerous oceanographic investigations have been made of the continental borderland. A brief summary of sea surface temperatures and salinities in the vicinity of Areas I and II are as follows:

	<u>Jan</u>	<u>May</u>	<u>Aug</u>	<u>Nov</u>
Mean Temperature (°C)	14.4	15.6	18.3	16.7
Mean Salinity (0/00)	33.5	33.5	33.5	34.0

In addition, average monthly wind, sea, and swell data conditions are listed in Appendix A. The area is apparently characterized by small seasonal excursions of temperature and salinity. Results similar to those obtained from this survey were obtained by NAVOCEANO during a survey in September and October 1965 of the area between San Clemente and San Nicolas Islands (report in preparation). Sound velocity profiles were similar; however, time series observations indicated variations of as much as 1.5 m/sec during a 24-hour period.

#### Methods and Procedures

Temperature, salinity, sound velocity, and visibility data were obtained in Areas I and II.

Temperature and salinity data were taken by standard Nansen casts at 7 stations in Area I and at 2 stations in Area II. The Nansen cast data in Area I were taken concurrently with the Ramsay Probe to confirm the sound velocity-temperature data.

Temperatures and sound velocities were measured at 35 stations in Area I. These data were obtained with a Ramsay, Mark-I, Deep-Sea Probe. The probe



is battery powered, frequency modulated, automatic digital recording, temperature and sound velocity measuring instrument.

Visibility data were measured at 13 stations with a prototype transmissometer constructed by Scripps Institution of Oceanography, La Jolla, California. The transmissometer has a folded beam, 2-meter water path, and gives a continuous analog trace of the coefficient of attenuation of light with depth, in natural log units per meter ( $\ln/m$ ).

#### Analysis and Results

The thermal structure of the waters off San Clemente Island was very stable during the survey period. Spatially the isotherms in the area varied little with depth as indicated by comparative data for stations shown in Figures 4 and 16. An isothermal layer,  $17^{\circ}$  to  $18^{\circ}\text{C}$ , was found from the surface to approximately 30 or 40 meters. At this depth a relatively sharp negative gradient occurred with an average temperature drop of  $5^{\circ}\text{C}$  per 35 meters (Figure 16). Below the thermocline, the negative gradient decreased to an almost linear rate of about  $1^{\circ}\text{C}$  per 125 meters. At station 6A the probe was placed on the bottom at 923 meters (504 fathoms), where a minimum temperature of  $4.58^{\circ}\text{C}$  was recorded.

#### Sound Velocity

Because the sound velocity characteristics of a water mass are chiefly a function of thermal characteristics, the sound velocity profiles in the area closely resemble those of the temperature profiles (Figure 17). An isovelocity condition of 1,516 to 1,517 m/sec., exists from the surface to depths of 30 or 40 meters. At this depth a sharp negative gradient occurred which was similar to that of the temperature profiles. Below the steep gradient, the sound velocity decreased at a rate of approximately 1 meter per

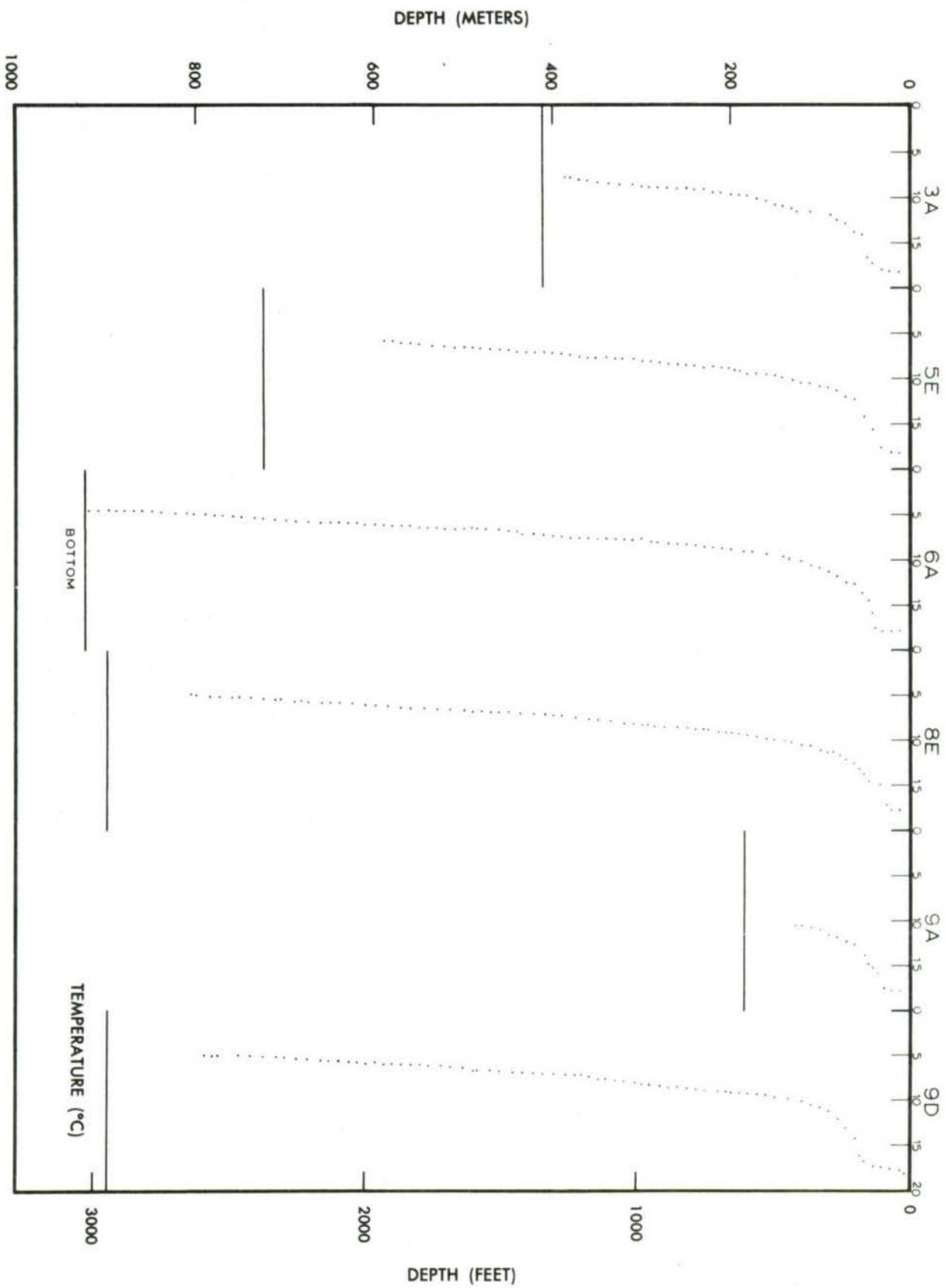


FIGURE 16. TYPICAL TEMPERATURE PROFILES—AREA I.

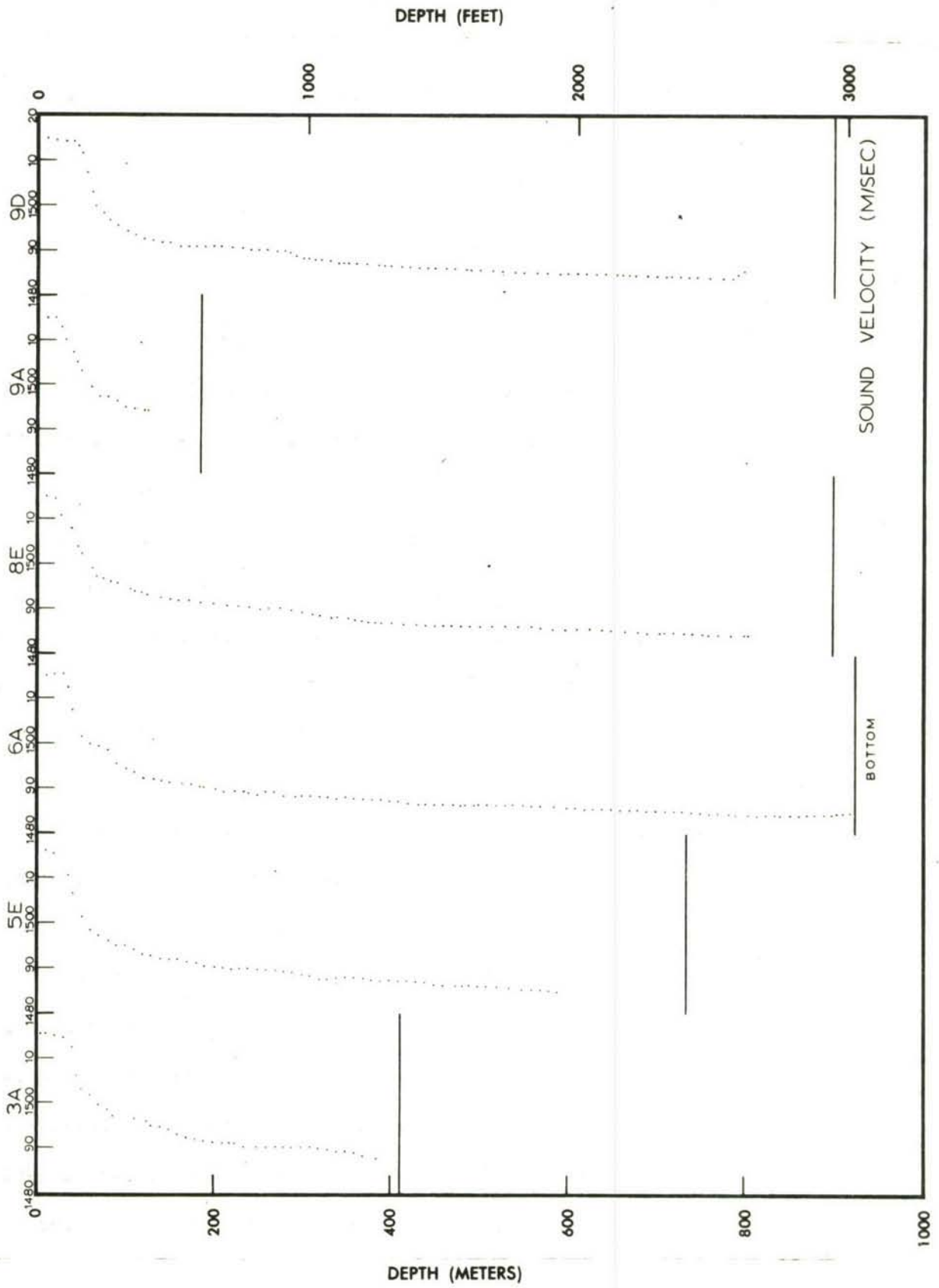


FIGURE 17. TYPICAL SOUND VELOCITY PROFILES—AREA I.



second per 100 meters of depth. A positive gradient was found only at the deeper stations where the depth was in excess of approximately 800 meters.

### Visibility

Visibility measurements were taken at the locations shown in Figures 5 and 18. The most conventional measurement of visibility is the attenuation coefficient ( $\alpha$ ) in natural log per meter (ln/m) units. This unit is inversely proportional to the attenuation length ( $\alpha^{-1}$ ) which is an easier unit to work with since it is directly related to visibility ranges. Under artificial lighting conditions, the visibility range in meters is  $4(\alpha^{-1})$ .

Maximum and minimum alpha readings were plotted for each station in Area I. Maximum alpha readings varied from 0.03 ln/m to 0.11 ln/m and were highest northeast of the dome (Figure 19). Alpha values of the surface and bottom water also increased northeast of the dome (Figures 20 and 21). The visibility minimum for the water column generally occurs between 30 and 40 meters (Figure 22).

Graphs of alpha and percent transmission per meter (T) versus depth are presented in Figures 23-29. All of the curves in Figures 23-29 are similar and these similarities can be used to analyze the general nature of visibility in the San Clemente area. The most turbid water occurs between 30 and 40 meters depth. The strong positive gradient shows the rapid relative increase in visibility with depth. Below this depth the gradient decreases until it reaches zero between 150 and 200 meters. At this point visibility is at a maximum and this maximum value is indicated by a line drawn tangent to the curve on each graph. Visibility deteriorates with depth at a very slow rate to bottom after the maximum is reached.

At Station 4E the transmissometer was lowered twice (Figure 25). Although the observations were made 60 hours apart, the curves are almost identical

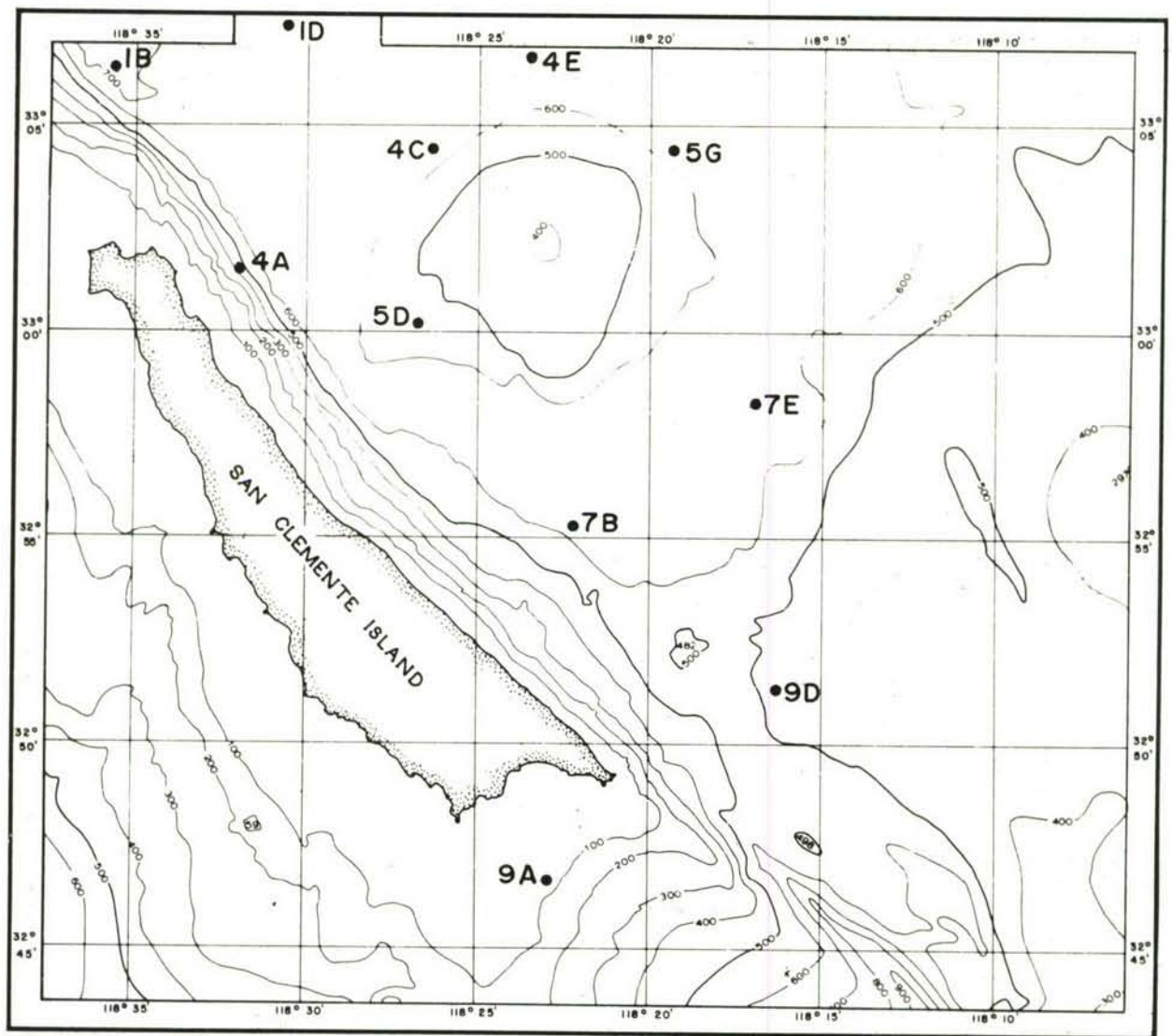


FIGURE 18. TRANSMISSOMETER STATIONS AREA I.

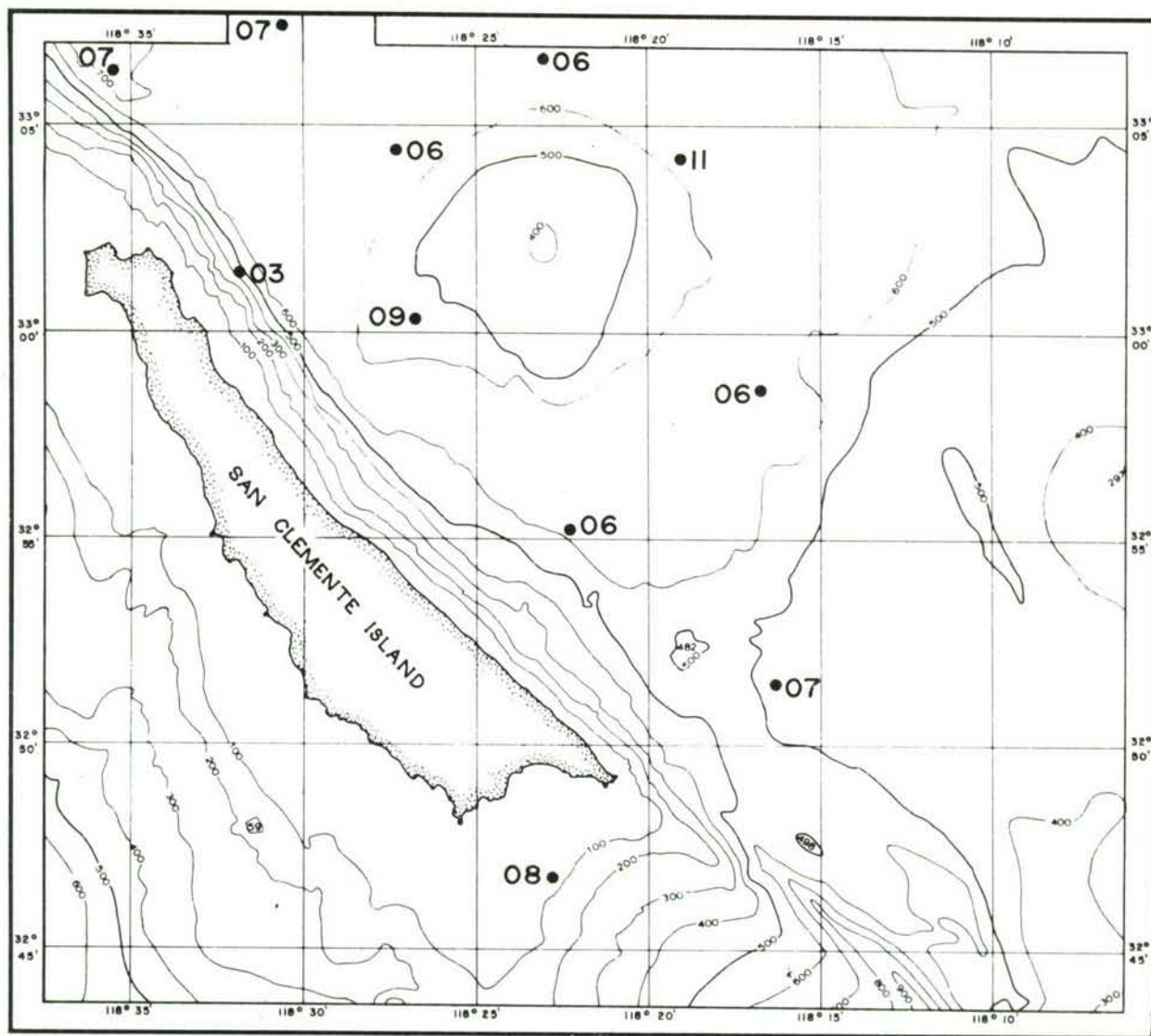


FIGURE 19. MAXIMUM VISIBILITY (ln/m) —AREA I.



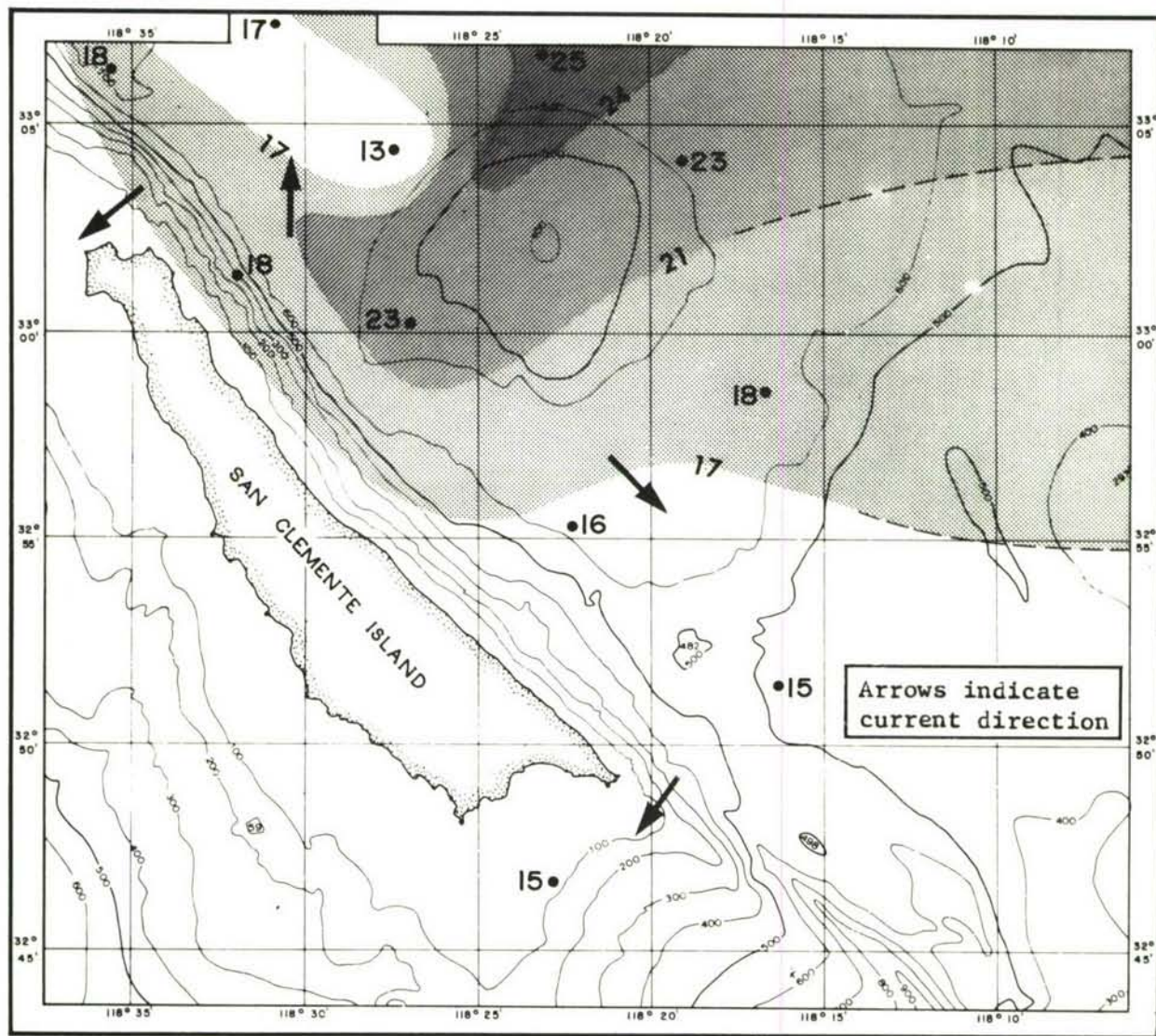


FIGURE 20. SURFACE VISIBILITY (ln/m)—AREA I.

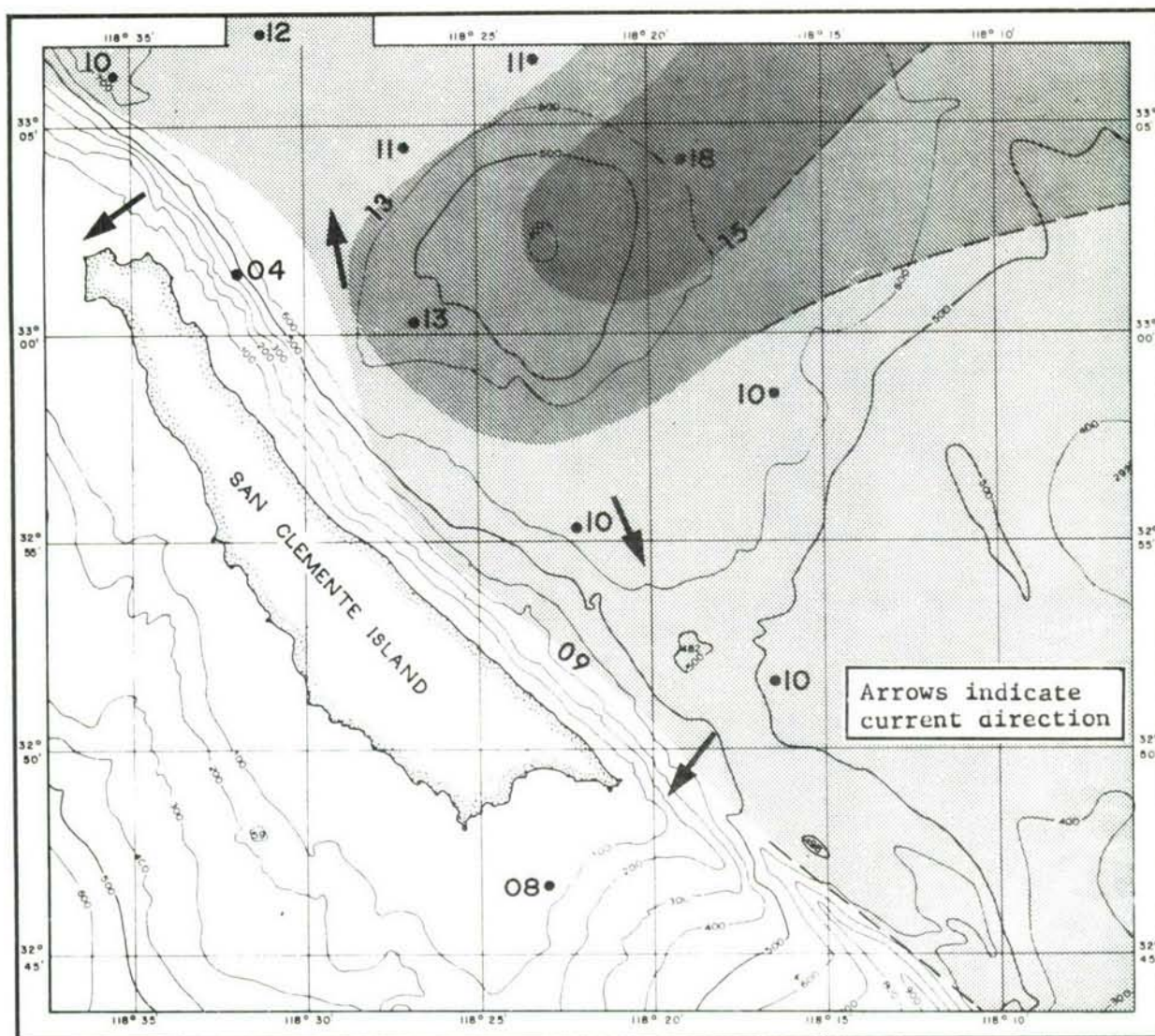


FIGURE 21. BOTTOM VISIBILITY ( $\ln/m$ )—AREA I.



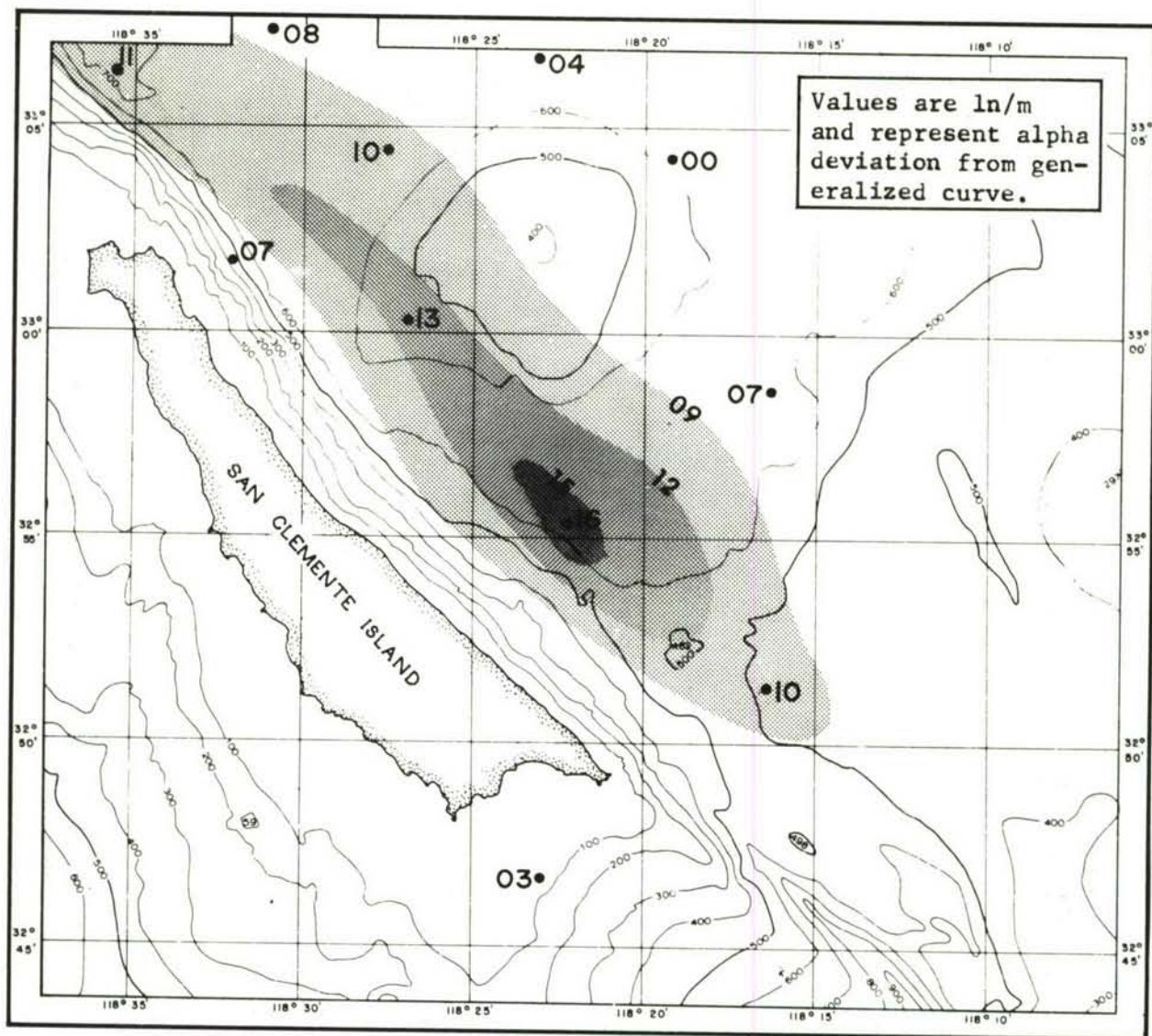


FIGURE 22. MINIMUM VISIBILITY LAYER—30 TO 40 METER DEPTH—AREA I.



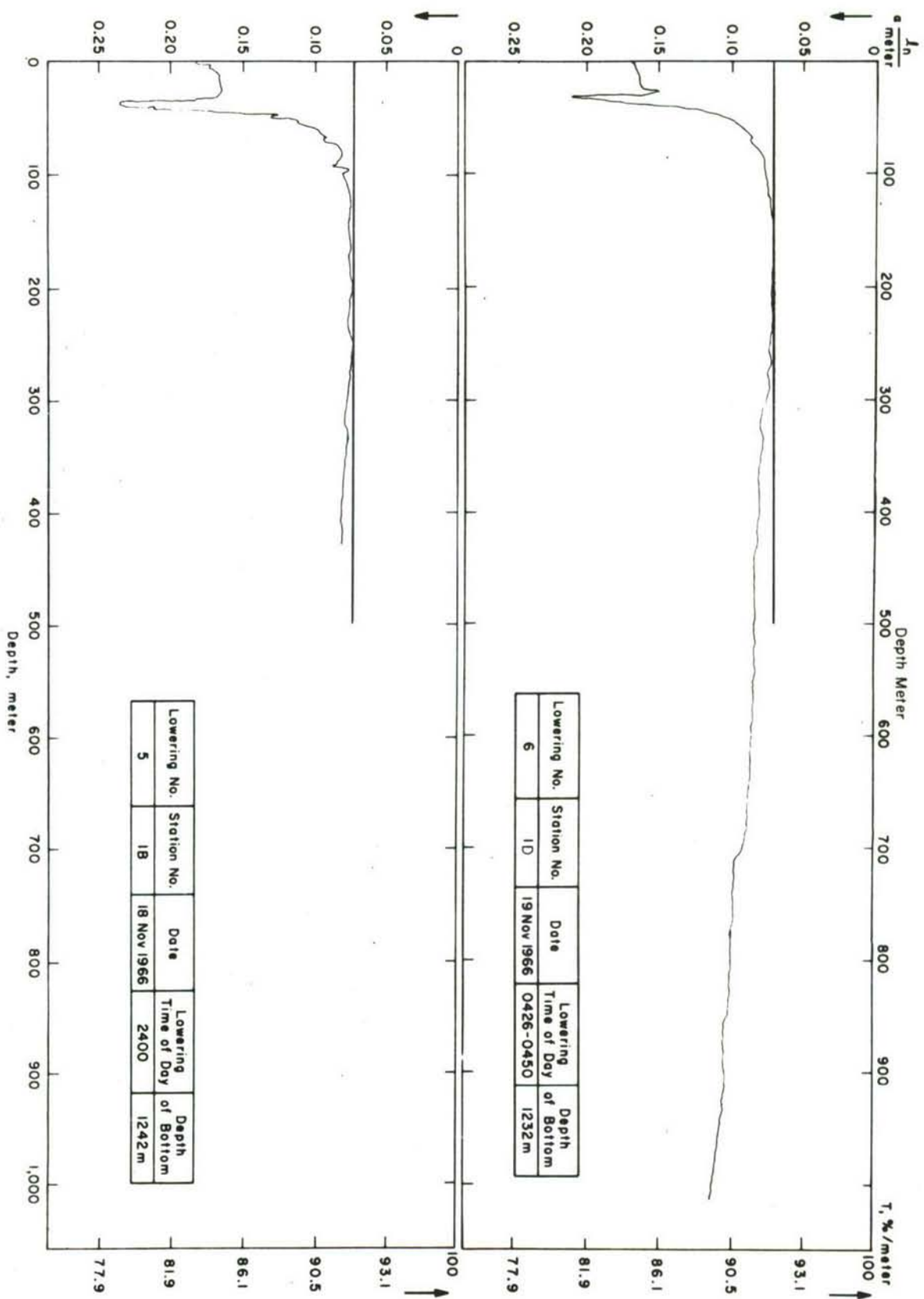


FIGURE 23. ALPHA VS DEPTH—STATION 1B AND 1D.

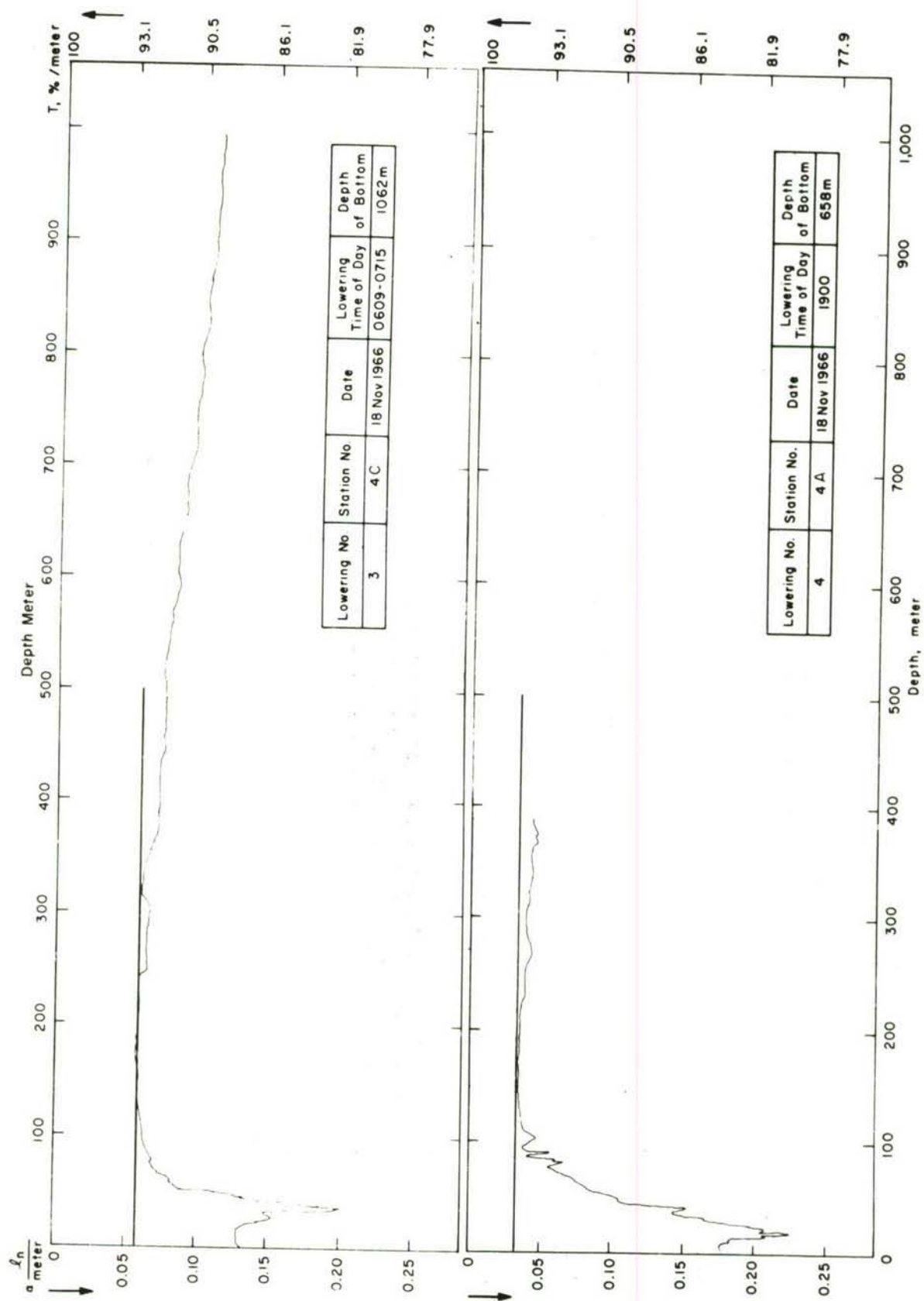


FIGURE 24. ALPHA VS DEPTH—STATION 4A AND 4C.

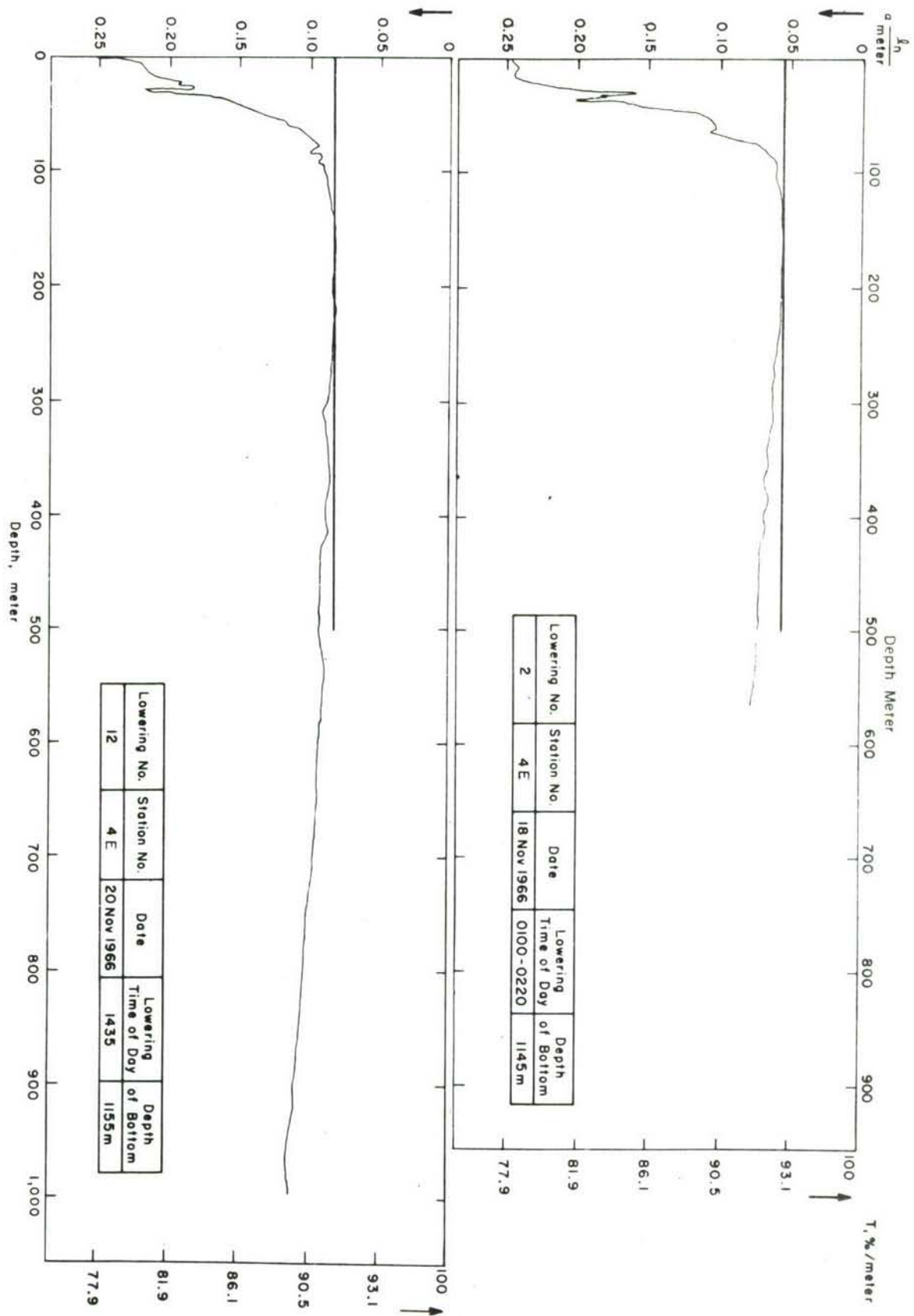


FIGURE 25. ALPHA VS DEPTH—STATION 4E.



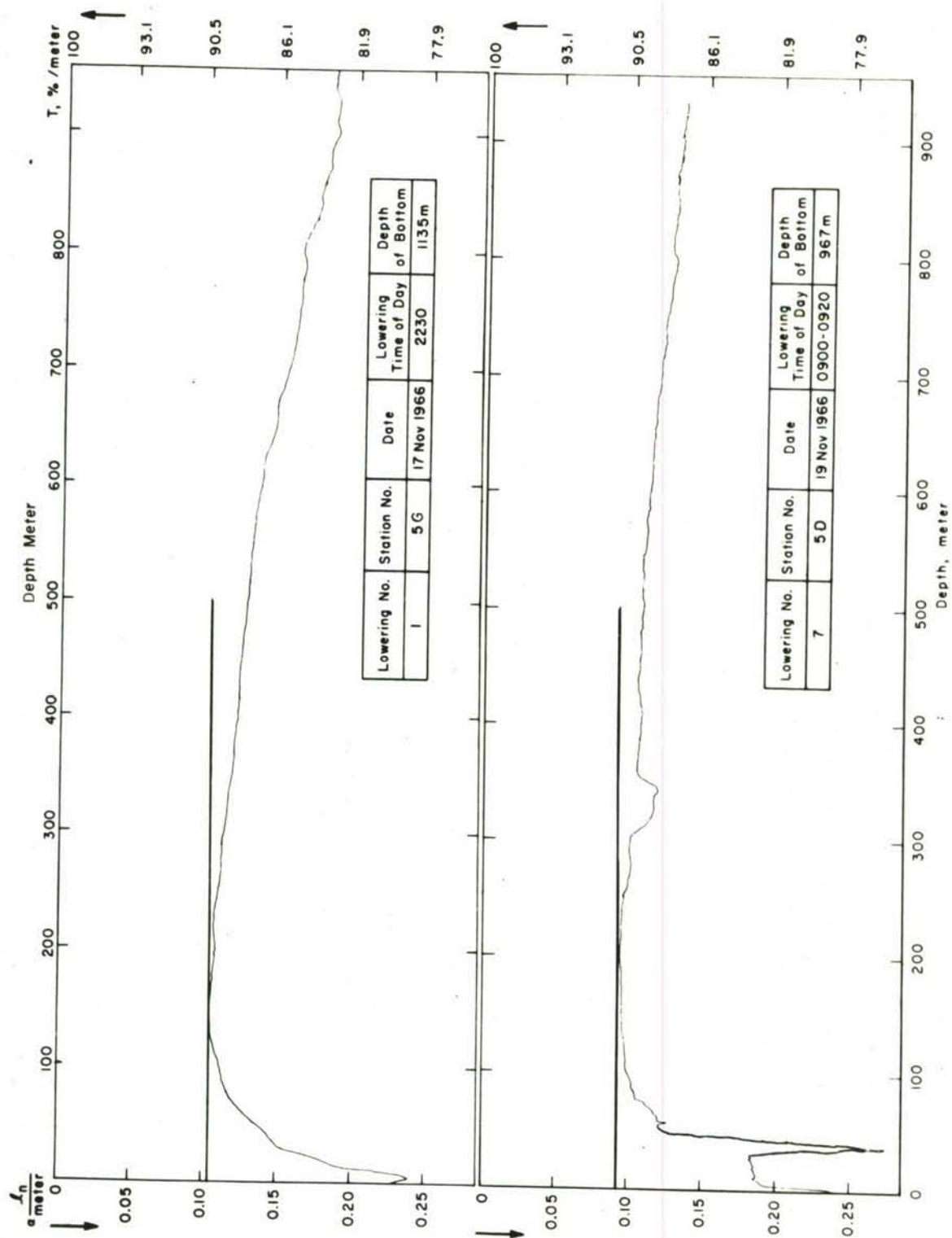


FIGURE 26. ALPHA VS DEPTH—STATION 5D AND 5G.

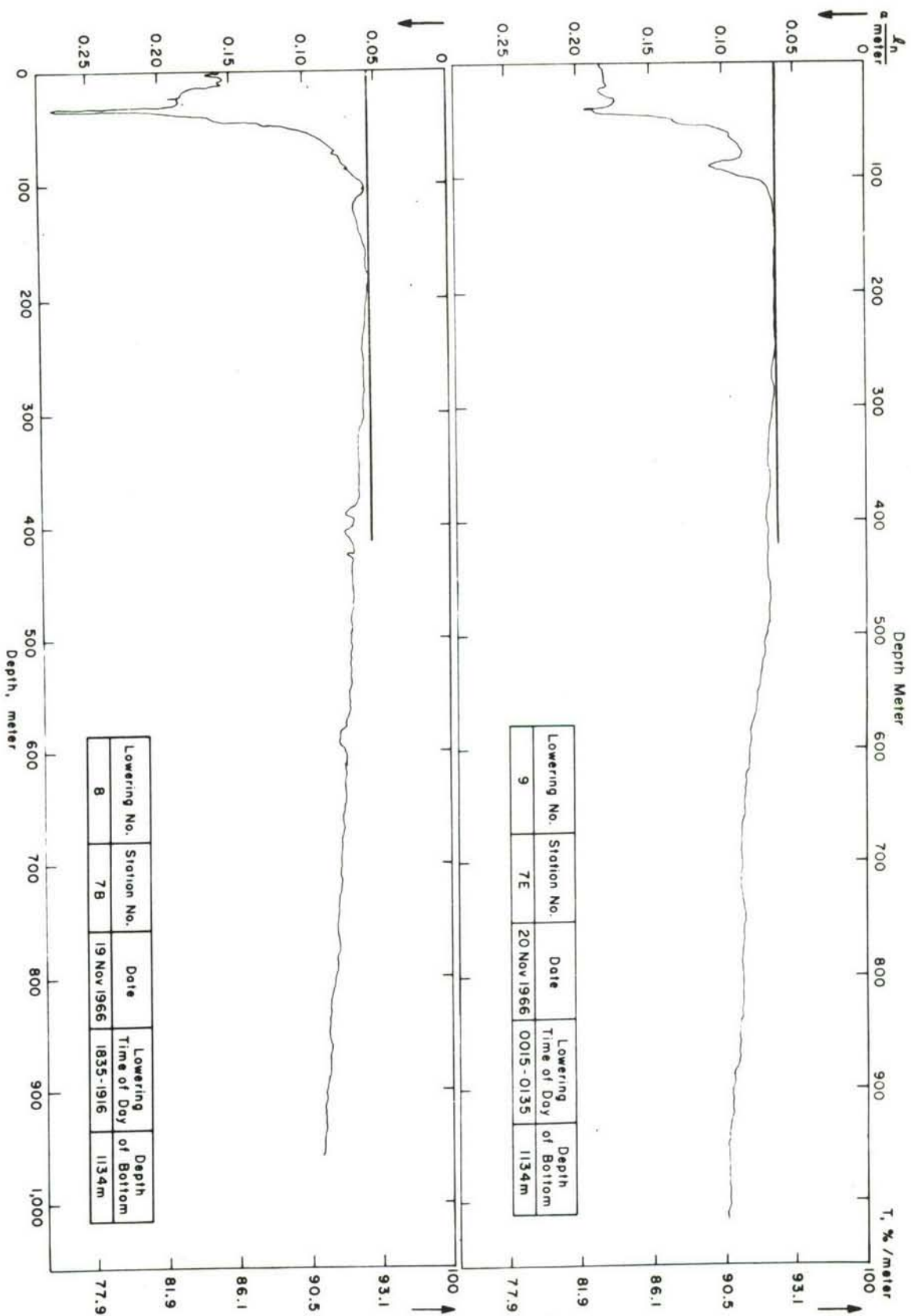


FIGURE 27. ALPHA VS DEPTH—STATION 7B AND 7E.

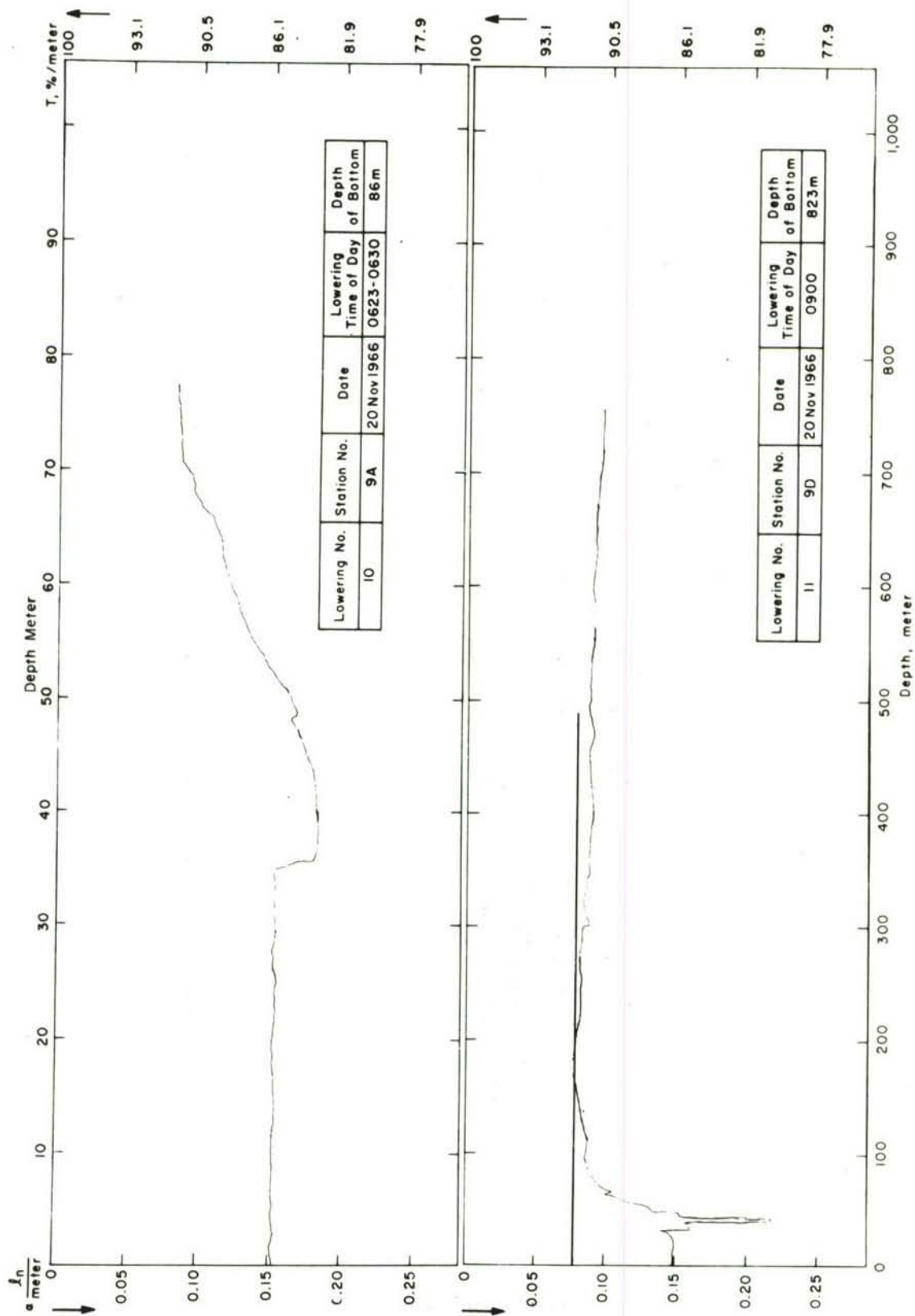


FIGURE 28. ALPHA VS DEPTH—STATION 9A AND 9D.



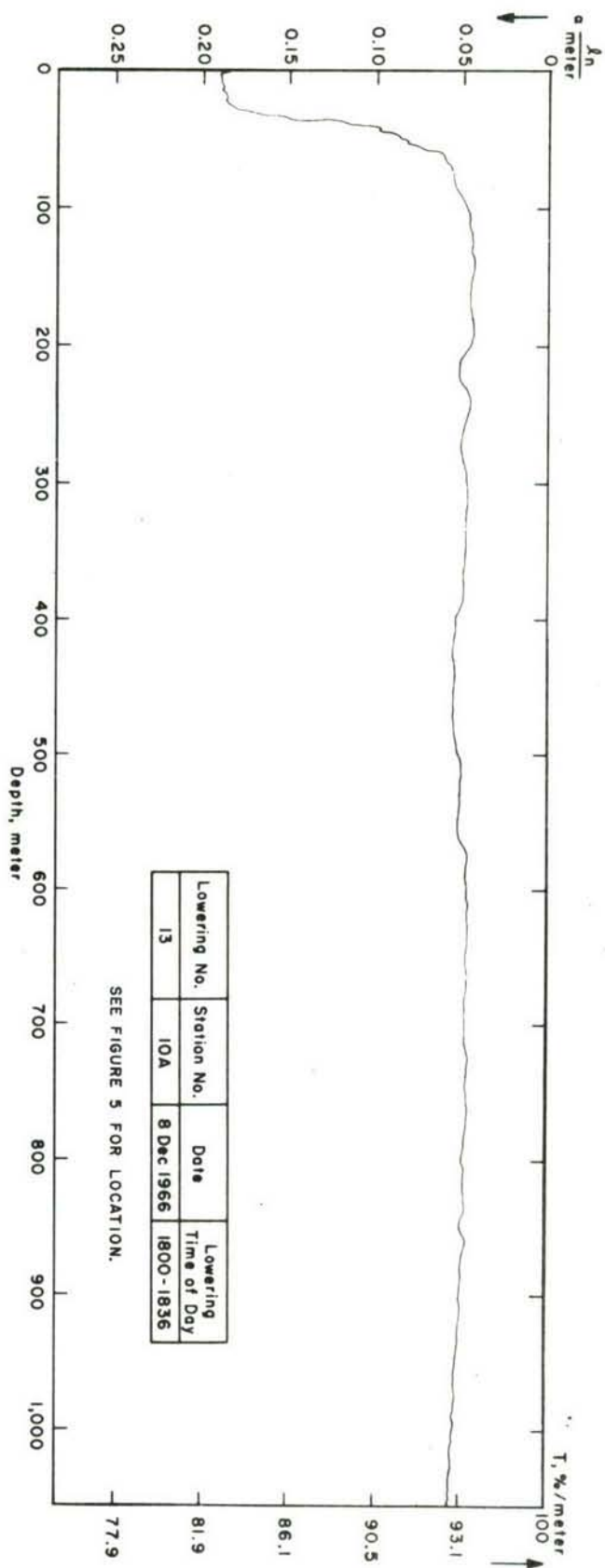


FIGURE 29. ALPHA VS DEPTH—STATION 10A—AREA II.

in shape. The major difference is the shift to higher alpha values in the second lowering, representing a general loss of visibility with time. Comparison of Figures 20 and 21 indicates a turbid water mass northeast of the island gradually decreasing to less turbid water in the direction of the island.

Consideration of the time dependence of the data from the two 4E stations and the synoptic currents as shown on Figures 20 and 21, suggests a turbid water mass that was moving toward the island from the northeast.

The simple form of the graph of the lowering at station 5G (Figure 26) is a model representation of the visibility characteristics of the water mass. However, it does not show all the characteristics common to this area as evidenced by a comparison with the other graphs. The most obvious and important deviation from the simple form, common to the other graphs, is an increase in alpha between the depths of approximately 30 and 40 meters. This phenomena coincides with a strong thermocline. The increase in alpha occurred abruptly at discrete depths and did not affect the water above or below. Consequently, an aqueous determinant was unlikely. Rather, the visibility losses were probably the result of plankton concentrations at the thermocline. Measurements of the deviations of alpha from the smoothed curve (in alpha units) provide a measure of the density of the determinant. A plot of the concentration of the determinants is presented in Figure 22. This figure indicates that an elongated cloud, probably of plankton, was concentrated in Area I.

Briefly summarized, visibility in Area I was as follows:

a. Maximum visibility ranges (minimum alpha values) were between 150 and 200 meters water depth.

b. Minimum visibility ranges (maximum alpha values) were generally between 30 and 40 meters water depth and probably were the results of plankton concentrations at the thermocline.

c. Alpha values ranged from 0.28 ln/m to 0.03 ln/m representing visibility ranges from about 14 to 130 meters.

d. Visibility varied with time as observed at station 4E. The largest fluctuations appear to depend on the currents.



#### IV. CURRENTS

##### General

Current meters were planted at the five sites shown in Figure 30. In addition observations were made at site 11C, located about 25 miles south-east of San Clemente Island in a water depth of 6,078 feet (Figure 5). Geodyne Model A-100 current meters with an accuracy of  $\pm 3$  percent at 0.3 knot and a direction resolution of  $\pm 2.5$  degrees were used.

A total of 19 current meters were used at depths ranging from 225 feet to 6,066 feet (Table I). Data were obtained from 9 meters which provided information for 2 sites at 500 feet, 2 sites at 2,200 feet, and 5 sites near the ocean bottom (Figure 31).

##### Methods and Procedures

Figure 32 shows a typical current meter array. The damping plate, shown above the anchor, was used to reduce the rate of descent as the array free-fell to the bottom. Meters at the bottom of the array were located between 12 and 36 feet above bottom depending on the site. The meters were suspended by 9/16-inch nylon line; a stretch factor of 7 percent was used to calculate (corrected) depths.

Deployment of the array began when the buoys were put over the side. The line was paid out slowly and each component attached in proper order. The ship advanced slowly in the direction of the proposed site to keep the array laid out properly.

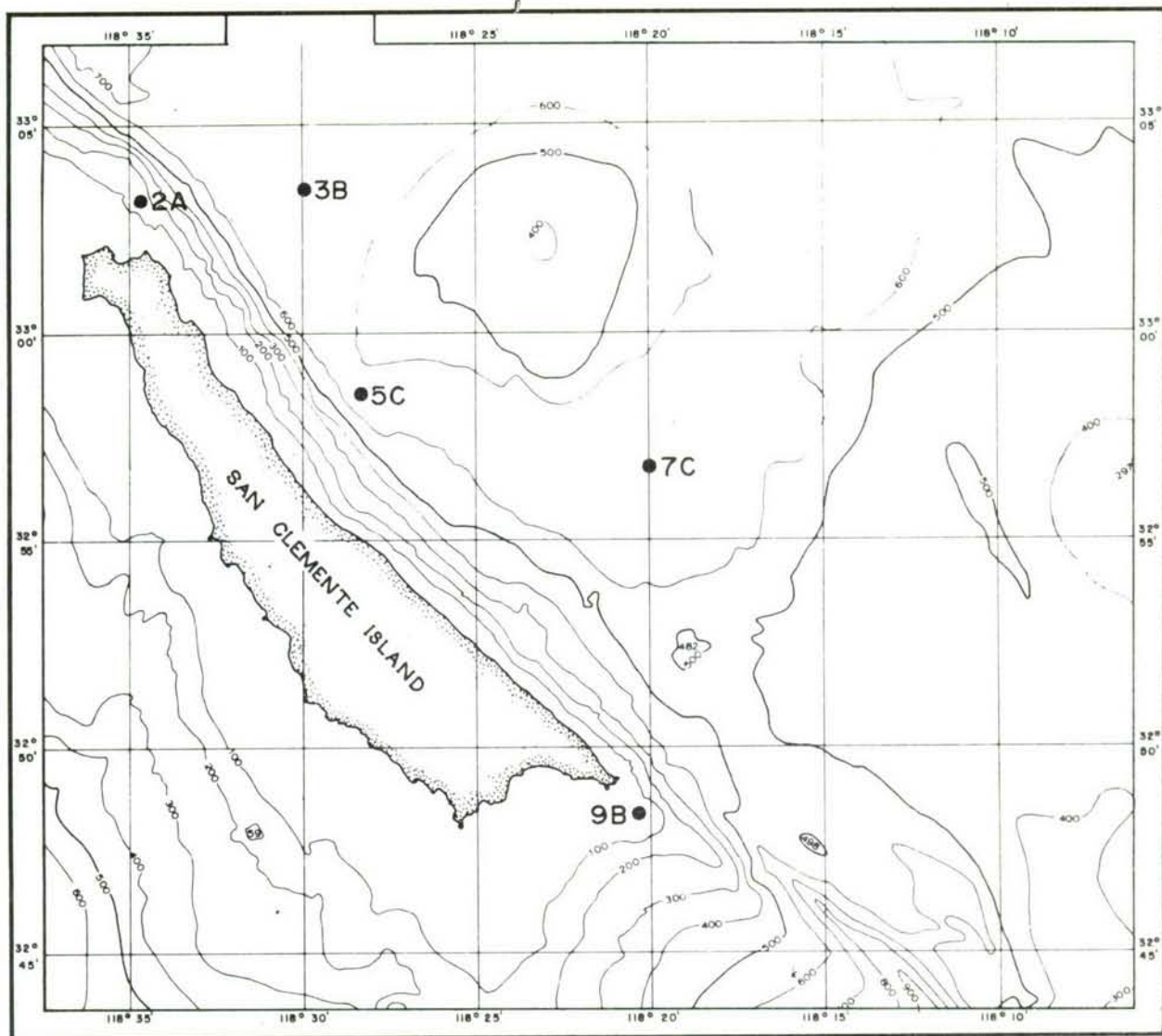


FIGURE 30. SITES—CURRENT OBSERVATIONS.

TABLE I. CURRENT METER DEPTH LIST AND OBSERVATION PERIOD

SITE	LATITUDE (North)	LONGITUDE (West)	WATER DEPTH (Feet)	DEPTH OF METER (Feet)	OBSERVATION PERIOD	
					Begin	End
2A	33°03.4'	118°34.8'	870	834 858	24 Oct 1966	22 Nov 1966 No Data
3B	33°04.3	118°29.8'	3960	500 2205 3923 3957	25 Oct 25 Oct	4 Dec 4 Dec No Data No Data
5C	32°58.8'	118°28.8'	3750	225 1830 3714 3737		No Data No Data No Data 22 Oct 19 Nov
7C	32°56.7'	118°19.8'	4080	536 2195 4040 4053	26 Oct 26 Oct 26 Oct	23 Nov 23 Nov No Data 23 Nov
9B	32°48.3'	118°20.1'	300	264 288		No Data 25 Oct 22 Nov (Direction Data Only)
11C	32°28.4'	118°06.4	6078	1015 6043 6066		No Data No Data 16 Nov 9 Dec



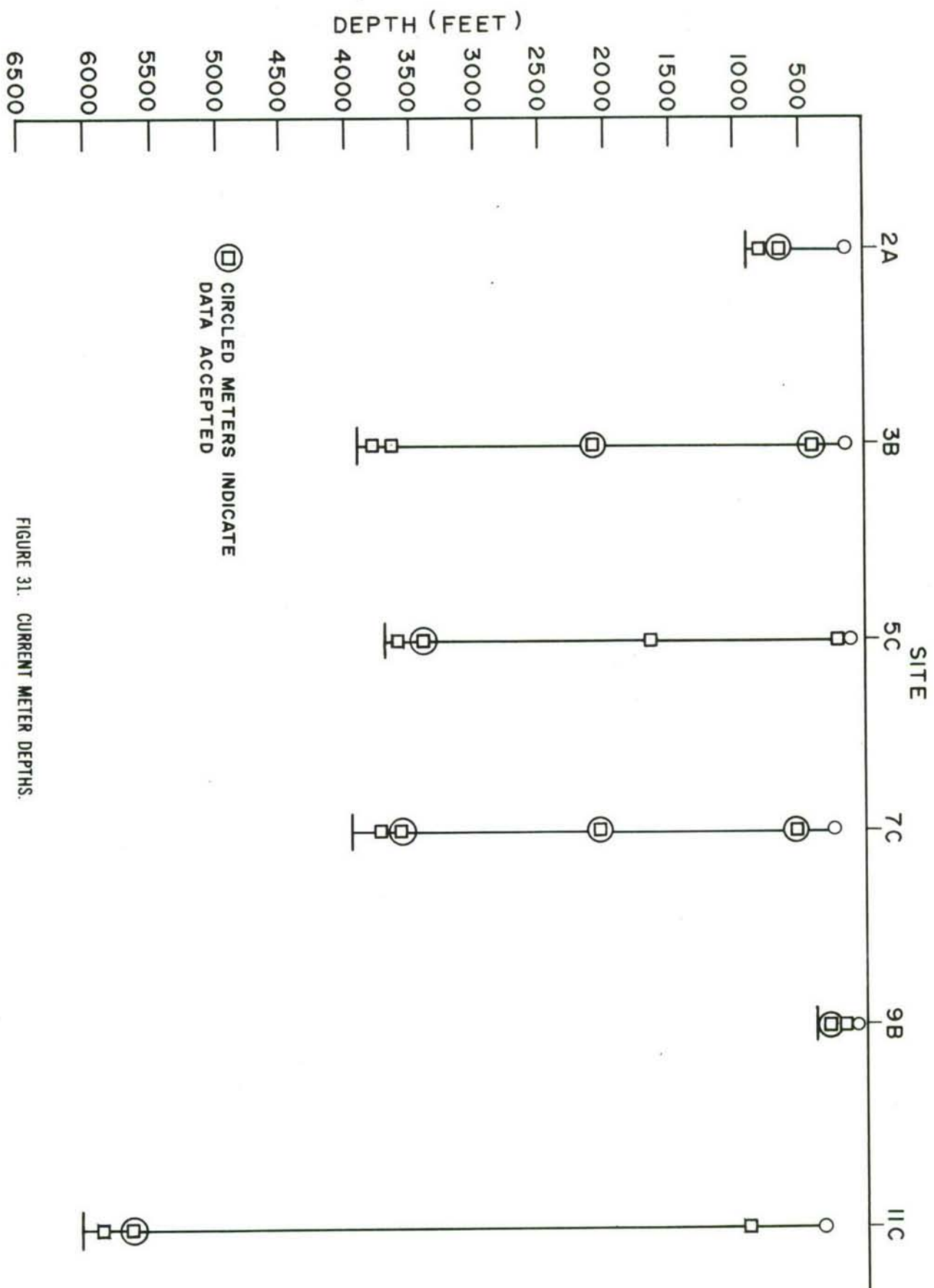


FIGURE 31. CURRENT METER DEPTHS.

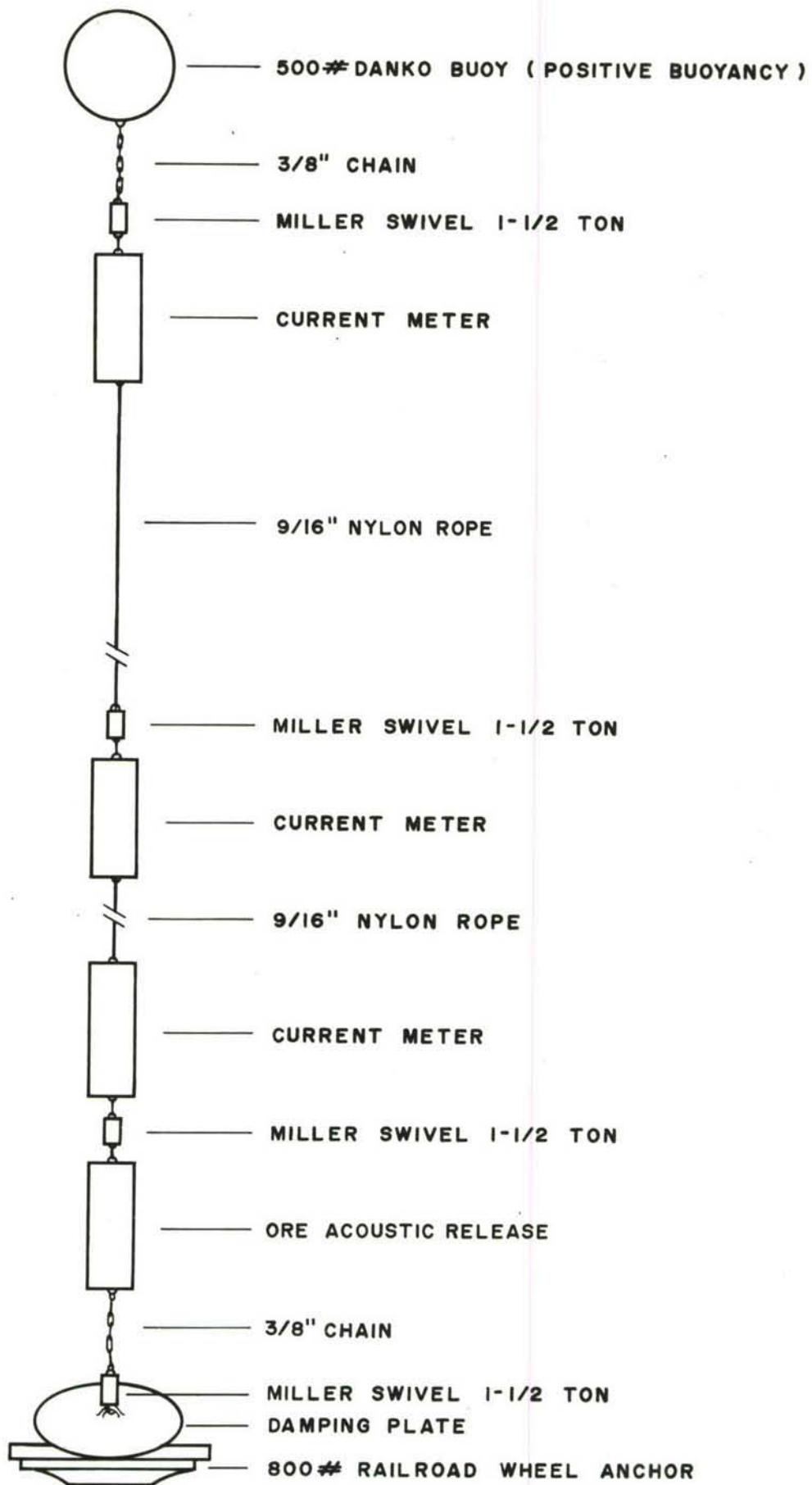


FIGURE 32. TYPICAL CURRENT METER ARRAY.

Geodyne Model A-100 current meters encode the data on standard 16mm photographic film. The meters were adjusted to strobe every 5 seconds during 50-second recording periods. A sampling rate of 10 minutes per hour was selected to make the record statistically valid and allow a recording life of sufficient length.

Most of the arrays were implanted in late October and retrieved in late November or early December. Retrieval was initiated by actuating Ocean Research Equipment, Inc. anchor releases by means of a coded acoustic signal transmitted from the surface vessel.

The raw data were processed by the Geodyne Corporation, Waltham, Massachusetts. Analyses of the data were made by the Bottom Environmental Survey Project, NAVOCEANO.

#### Analysis and Results

Tides - To evaluate the effects of tidal forces on the currents in the area, especially those at or near the ocean bottom, tide data were requested from the Coast and Geodetic Survey. No observed data were available for San Clemente Island; as a result, data from observations made in Los Angeles Harbor were used (U. S. Coast and Geodetic Survey). No attempt was made to separate the non-tidal and tidal components.

Tides in the San Clemente Island area are mixed; that is, two high waters and two low waters occur each tidal day, with large inequalities in their heights. During the time of the observations, highest high waters and lowest low waters took place several hours before and after the time of New Moon. The time of least vertical excursion between the daily high waters occurred one day before the First Quarter phase of the moon.

Currents - Current meters were planted at select sites around the dome located northeast of San Clemente Island. Arrays 3B, 5C, and 7C (Figure 30)



were each placed about 6 miles from the summit of the dome. Where mean current speeds are given, the speeds were averaged over various periods of time, ranging from 1 to 6 hours. Short-term fluctuations in speed are evident, but usually non-consistent, and higher speeds usually occurred during times of lower semidiurnal waters.

Two meters on each of arrays 3B and 7C were located at about the same depths: 500 feet and 2,200 feet. Comparison of the records (Appendix B) shows some similarities in the current directions, but the current speeds are dissimilar.

At the 500-foot depth, prevailing directions at site 7C are southeast and northeast; at site 3B they are northeast and southeast, with an additional strong component to the northwest.

Currents at 500 feet, site 7C, fluctuated in speed from less than 0.20 knot to 0.31 knot from the beginning of the record until 4 November. On that date, currents increased to 1.00 knot, after which the speed fluctuated between 0.50 and 1.30 knot. The current speeds did not exceed 0.20 knot at the 500-foot depth at site 3B.

At the 2,200-foot depth, the prevailing directions at site 7C are southeast and southwest. At site 3B there are three principal directional components, northeast, south, and northwest.

The current speed at 2,200 feet in site 3B did not exceed 0.20 knot, whereas at site 7C, at that depth, there were several periods (usually associated with low waters, and especially at the time of new moon) when the current speeds reached 0.40 knots and averaged about 0.21 knots.

Most data obtained near the bottom were of poor quality; as a result, interpretation was difficult. There are similarities in the records obtained

by the near bottom meters at site 2A and 5C. Direction vs Time plots show that the currents were rotary most of the time (Appendix B). The change of the tidal height with time compares favorably with the change in speed of the current. Resemblance of the tide curve to variation of current speed is an indication that the currents were influenced by the tides.

The mean current speed for the recording period at site 2A, computed for those speeds which had significant frequencies of occurrence, was 0.05 knot. (Zero current speed was not included in the computations.) The frequency of occurrence of zero speed was about equal to that of the combined frequencies of all other speeds, and its inclusion would have reduced the mean to a misinterpreted value. As stated above, a favorable comparison exists between the tide curve and time variation of current speed at this site. These times usually corresponded to the periods of high and low waters, and it is then when appreciable current speeds were attained; and it is to these periods that the mean speed applies. The maximum speed of a significant frequency of occurrence was 0.15 knot. These speed values compare favorable with those of observations made nearby (Carrison, et al, 1961).

Mean current speeds at site 5C (using the same computational procedures as for site 2A) was 0.09 knot. The maximum speed was 0.23 knots for a significant frequency of occurrence.

The bottom meter at site 9B malfunctioned in such a manner as to record only direction. No speed data are available. Two distinct directional components are shown in the polar coordinate histogram plot of direction (Appendix B): east-northeast and south-southeast.

At site 11C, Area II, three main direction components are evident (Appendix B) from data obtained from the meter located near-bottom: north-northeast, southwest and west. The currents appear to have been rotary during the First Quarter phase of the moon, but changed to reversing after Full Moon. This indicates that a tidal component is present. The mean speed at 6066 - 10 foot depth (12-feet above bottom) was 0.08 knot, and the maximum speed of a significant frequency of occurrence was 0.38 knot.

### Conclusions

As stated above, 9 of the 19 meters implanted functioned properly. Because of a lack of adequate sampling of the water column, a definitive account of the current regime in the San Clemente Island area cannot be made. Also, in order to gain an understanding of the current patterns, the effects of topography, and seasonal variations, a prolonged series of observations should be made within and adjacent to the area.

From the data that are available, several conclusions were made concerning the currents in the area: (1) tide forces exerted an influence to the deepest depth sampled (6,000 feet); (2) bottom currents attained speeds as great as 0.20 knot; (3) current speeds at the 500-foot depth just south of the dome were relatively high (0.20 - 1.30 knots).



## V. INSTRUMENTATION DEVELOPMENT

### Purpose

The instrumentation developments of this project are intended to provide a capability for measuring the environmental parameters that cannot be measured easily with conventional configurations of instruments that are used for normal oceanographic operations. For the most part, the developments involved design, fabrication, and testing of systems comprised of conventional instruments arranged in novel configurations. The instruments were designed to measure micro-bathymetry, currents, visibility, and sediment characteristics.

### Systems

Deep Towed High Resolution Profiler (DTP) - The performance objective of the DTP was to obtain high resolution bathymetry or bottom roughness data along with high resolution subbottom profiling. The system needed to be relatively inexpensive and capable of being readily rigged for deployment from different ships (Figure 11).

By positioning a 12 KHz transducer near the bottom, a 30° beam width (at-3db point) provides fairly high resolution of the bottom topography. The close proximity of the instrument to the bottom minimizes spreading and attenuation losses of acoustic energy. With modest acoustic energy output, good penetration and resolution of the subbottom reflecting horizons are obtained. An upward-looking transducer is used to determine the depth and horizontal stability of the system by monitoring the acoustic signal reflected from the sea surface.

Transducers are keyed by the recording and control systems aboard the tow ship. Signals for keying the transducers, and signals received when the

transducers are in the listening mode, are transmitted through an armored, coaxial tow cable.

Results of field testing this first system, at San Clemente Island, indicated that high resolution bathymetry and subbottom profiling could be obtained with a system towed close to the bottom. The DTP was capable of being readily rigged, and is comprised of off-the-shelf equipment. The problems encountered include: (1) severe limitations on tow speed; (2) the ships roll motions were transmitted via the cable to the towed vehicle and resulted in the motions being superimposed on the recordings of the bottom topography; (3) limited battery capacity which required recovery of the system to change batteries after about four hours of operation; (4) limited capability for changing pulse duration and repetition rate; and (5) in areas with greatly changing depth or steep bottom slopes, the winch had to lower or raise the towed vehicle to avoid bottom contact while continuing to maintain the desired topographic resolution.

Photographic Visibility Systems - Two systems were built and field tested to determine if near bottom visibility could be determined by photographic techniques.

A system using conventional deep-operating oceanographic camera components was used to photograph a target composed of 6 wedged shaped colors grading from white to black. Eight targets were mounted at fixed distances from the camera on the supporting frame. The targets were arranged so that their surface was normal to the incident light. A capability also existed for switching from one light source-camera pair to the other pair without retrieving the system. A pinger mounted on the camera framework was monitored by the ship's UQN to allow winch adjustments for controlling the tow-

ing depth. The data chamber of one camera was modified by removing the depth gauge and mounting a meter for monitoring battery voltage, in order that light intensity correlations could be made by observing the recorded voltage values on the data-frame portion of the photographic record.

A moored photographic-visibility system, similar to the towed system, was constructed. The moored system employed gray, wedge targets mounted in a frame below the camera mounting; however, this system employed a special timing circuitry that controlled exposures at fixed intervals for up to 30 days. The system is shown in Figure 33. A special feature of the system was a set of 6 tubes, each 30 inches long, that were loaded with 1/2-inch diameter steel balls. Periodically timing circuitry fired a squib that caused one of the tubes to open and drop the column of balls which fell to the bottom (within the field view of the camera). When the balls were dropped, the camera system made exposures every 10 seconds for a period of 5 minutes, before returning to the usual rate. By photographing the falling steel balls and the turbidity created, it was anticipated that an indication would be obtained of the character of the sediments and bottom currents in relation to the degradation of near bottom visibility. Initial indications were that this system should perform properly in deep water; however, this array was lost due to the parting of a nylon line used to support the system. Efforts to retrieve this system are continuing.



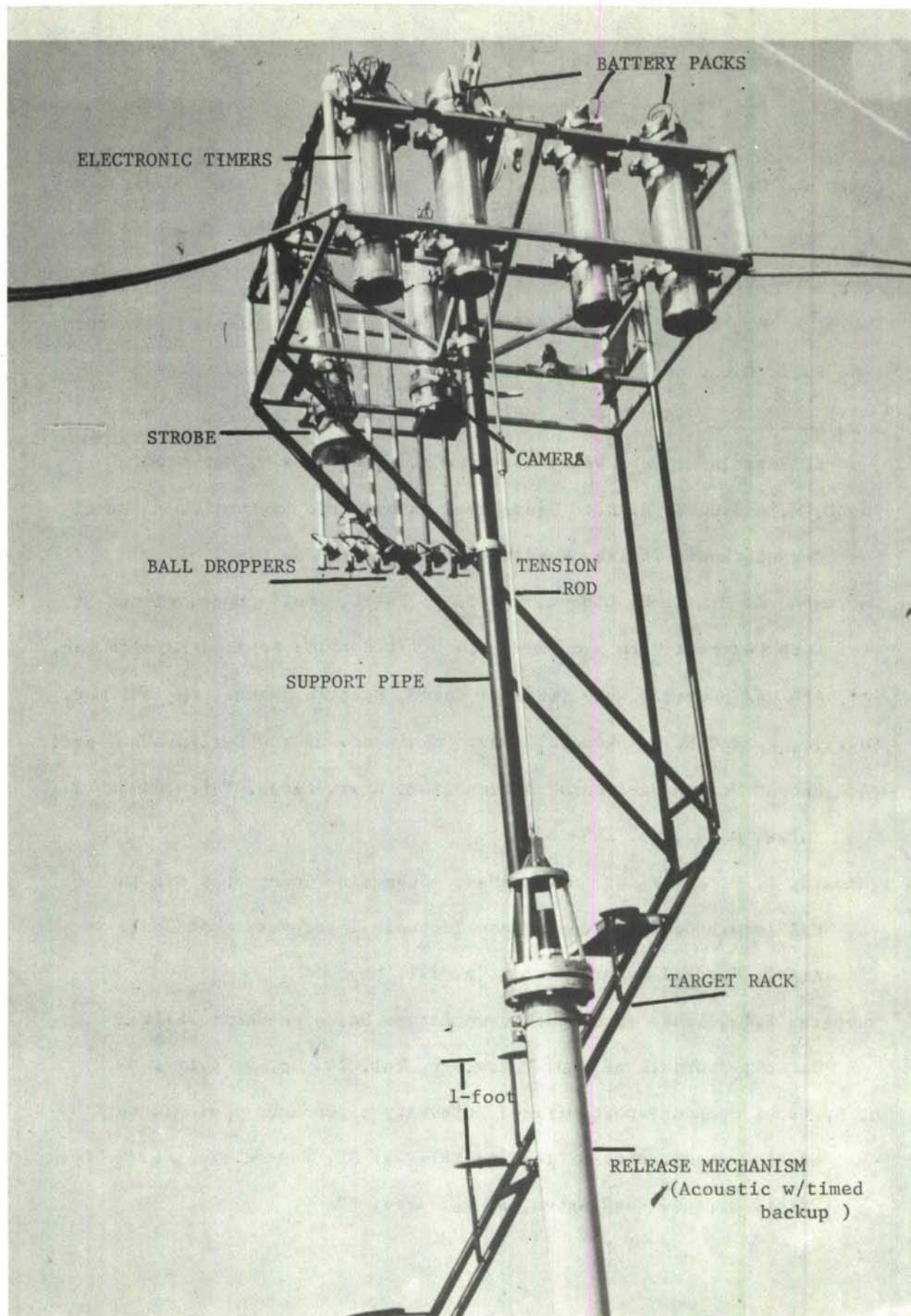


FIGURE 33. BOTTOM MOUNTED CAMERA SYSTEM.

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APPENDIX A

PHYSICAL OCEANOGRAPHIC DATA

Ramsay Probe, Nansen Cast, Sea State, Swell,  
and Monthly Wind Force Data



# RAMSAY PROBE DATA

DEPTH (M)	SD. VEL. (M/S)	TEMP. C°	DEPTH (M)	SD. VEL. (M/S)	TEMP. C°
05000002	06015103	07001872	05000212	06014929	07000867
05000006	06015103	07001872	05000215	06014928	07000861
05000010	06015103	07001869			
05000015	06015179	07001861			
05000021	06015175	07001843			
05000026	06015165	07001812			
05000029	06015157	07001774			
05000033	06015134	07001717			
05000036	06015106	07001597			
05000039	06015087	07001533			
05000043	06015076	07001475			
05000047	06015052	07001405			
05000050	06015037	07001333			
05000055	06015027	07001292			
05000057	06015017	07001270			
05000062	06015006	07001218			
05000065	06015005	07001202			
05000070	06015000	07001189			
05000071	06015001	07001188			
05000073	06014998	07001178			
05000075	06014987	07001141			
05000076	06014986	07001129			
05000078	06014985	07001126			
05000083	06014983	07001121			
05000085	06014980	07001103			
05000089	06014979	07001098			
05000092	06014978	07001095			
05000095	06014976	07001089			
05000099	06014974	07001075			
05000103	06014973	07001071			
05000106	06014967	07001047			
05000110	06014966	07001040			
05000114	06014965	07001039			
05000117	06014965	07001034			
05000121	06014960	07001014			
05000124	06014959	07001006			
05000129	06014958	07001005			
05000132	06014958	07000997			
05000136	06014957	07000995			
05000139	06014957	07000991			
05000143	06014954	07000983			
05000147	06014954	07000980			
05000151	06014951	07000972			
05000154	06014947	07000952			
05000158	06014947	07000949			
05000161	06014947	07000947			
05000165	06014945	07000940			
05000169	06014944	07000936			
05000172	06014943	07000931			
05000175	06014940	07000923			
05000179	06014940	07000912			
05000183	06014938	07000912			
05000186	06014937	07000905			
05000190	06014936	07000898			
05000193	06014934	07000892			
05000196	06014933	07000887			
05000200	06014931	07000878			
05000204	06014931	07000873			
05000208	06014930	07000872			



CHANNEL IDENTIFIERS

## EXPLANATORY NOTE:

CHANNEL 05-DEPTH IN WHOLE METERS

CHANNEL 06-SOUND VELOCITY IN TENTHS  
OF METERS PER SECOND

CHANNEL 07-TEMPERATURE IN HUNDRETHS °C

STATION  
1A

DATE  
3 NOV, 1966

TIME  
16:21Z

LOCATION  
33°04.0'N × 118°38.0'W

CRUISE  
056610

## RAMSAY PROBE DATA

DEPTH (M)	S.D.	VEL. (M/S)	TEMP C°
05000051	0601 h649	07000460	
05000052	0601 h649	07000460	
05000092	0601 h650	07000478	
05000096	0601 h650	07000477	
05000094	0601 h651	07000476	
05000095	0601 h651	07000476	
05000095	0601 h651	07000476	
05000094	0601 h651	07000476	
05000095	0601 h652	07000473	
05000093	0601 h653	07000472	
05000097	0601 h653	07000472	
05000097	0601 h653	07000472	
05000080	0601 h655	07000472	
05000098	0601 h655	07000471	
05000091	0601 h656	07000471	
05000096	0601 h657	07000470	
05000099	0601 h658	07000471	
05001005	0601 h658	07000471	
05001010	0601 h659	07000470	
05001014	0601 h659	07000471	
05001020	0601 h661	07000470	
05001026	0601 h662	07000470	
05001030	0601 h662	07000470	
05001036	0601 h664	07000471	
05001041	0601 h664	07000470	
05001045	0601 h665	07000470	
05001050	0601 h665	07000469	
05001055	0601 h666	07000470	
05001060	0601 h667	07000470	
05001065	0601 h668	07000469	
05001071	0601 h669	07000469	
05001076	0601 h670	07000469	
05001081	0601 h670	07000470	
05001086	0601 h670	07000470	
05001090	0601 h672	07000469	
05001094	0601 h672	07000469	
05001095	0601 h673	07000469	
05001109	0601 h674	07000469	
05001115	0601 h676	07000469	
05001120	0601 h676	07000469	
05001125	0601 h676	07000469	
05001130	0601 h677	07000469	
05001134	0601 h678	07000466	
05001139	0601 h678	07000466	
05001144	0601 h679	07000466	
05001149	0601 h680	07000466	
05001154	0601 h680	07000466	

59



## RAMSAY PROBE DATA

[illegible]

LOCATION	CRUISE
33°08.2'N × 118°33.0'W	056610

DATE	TIME
11 NOV. 1966	03:31Z

STATION  
1C



DEPTH SD. VEL. TEMP.		DEPTH SD. VEL. TEMP.		DEPTH SD. VEL. TEMP.		DEPTH SD. VEL. TEMP.		DEPTH SD. VEL. TEMP.		DEPTH SD. VEL. TEMP.	
(M)	(M/S)	(M)	(M/S)	(M)	(M/S)	(M)	(M/S)	(M)	(M/S)	(M)	(M/S)
0900000	0601514	0700181	0700181	0800356	0800356	0900568	0900568	1000770	1000770	1100972	1100972
0900000	0601515	0700182	0700182	0800357	0800357	0900569	0900569	1000771	1000771	1100973	1100973
0900000	0601516	0700183	0700183	0800358	0800358	0900570	0900570	1000772	1000772	1100974	1100974
0900000	0601517	0700184	0700184	0800359	0800359	0900571	0900571	1000773	1000773	1100975	1100975
0900000	0601518	0700185	0700185	0800360	0800360	0900572	0900572	1000774	1000774	1100976	1100976
0900000	0601519	0700186	0700186	0800361	0800361	0900573	0900573	1000775	1000775	1100977	1100977
0900000	0601520	0700187	0700187	0800362	0800362	0900574	0900574	1000776	1000776	1100978	1100978
0900000	0601521	0700188	0700188	0800363	0800363	0900575	0900575	1000777	1000777	1100979	1100979
0900000	0601522	0700189	0700189	0800364	0800364	0900576	0900576	1000778	1000778	1100980	1100980
0900000	0601523	0700190	0700190	0800365	0800365	0900577	0900577	1000779	1000779	1100981	1100981
0900000	0601524	0700191	0700191	0800366	0800366	0900578	0900578	1000780	1000780	1100982	1100982
0900000	0601525	0700192	0700192	0800367	0800367	0900579	0900579	1000781	1000781	1100983	1100983
0900000	0601526	0700193	0700193	0800368	0800368	0900580	0900580	1000782	1000782	1100984	1100984
0900000	0601527	0700194	0700194	0800369	0800369	0900581	0900581	1000783	1000783	1100985	1100985
0900000	0601528	0700195	0700195	0800370	0800370	0900582	0900582	1000784	1000784	1100986	1100986
0900000	0601529	0700196	0700196	0800371	0800371	0900583	0900583	1000785	1000785	1100987	1100987
0900000	0601530	0700197	0700197	0800372	0800372	0900584	0900584	1000786	1000786	1100988	1100988
0900000	0601531	0700198	0700198	0800373	0800373	0900585	0900585	1000787	1000787	1100989	1100989
0900000	0601532	0700199	0700199	0800374	0800374	0900586	0900586	1000788	1000788	1100990	1100990
0900000	0601533	0700200	0700200	0800375	0800375	0900587	0900587	1000789	1000789	1100991	1100991
0900000	0601534	0700201	0700201	0800376	0800376	0900588	0900588	1000790	1000790	1100992	1100992
0900000	0601535	0700202	0700202	0800377	0800377	0900589	0900589	1000791	1000791	1100993	1100993
0900000	0601536	0700203	0700203	0800378	0800378	0900590	0900590	1000792	1000792	1100994	1100994
0900000	0601537	0700204	0700204	0800379	0800379	0900591	0900591	1000793	1000793	11	

STATION	DATE	TIME	LOCATION	CRUISE
1D	11 NOV, 1966	04:31Z	33°09.6'N × 118°30.7'W	056610



[illegible]

STATION	DATE
2C	11 NOV, 19



## RAMSAY PROBE DATA

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
05000003	06015161	07001840		05000182	06014909	07000949		05000534	06014866	07000678		05000735	06014893	07000568		05000926	06014849	07000485	
05000008	06015163	07001840		05000185	06014907	07000943		05000543	06014865	07000675		05000742	06014892	07000562		05000931	06014850	07000484	
05000011	06015164	07001840		05000189	06014906	07000936		05000552	06014864	07000666		05000744	06014891	07000560		05000936	06014850	07000483	
05000016	06015164	07001841		05000193	06014903	07000930		05000555	06014864	07000664		05000751	06014892	07000557		05000940	06014851	07000483	
05000021	06015164	07001840		05000196	06014902	07000921		05000560	06014863	07000663		05000754	06014891	07000554		05000945	06014852	07000482	
05000025	06015165	07001840		05000200	06014903	07000920		05000565	06014864	07000662		05000760	06014890	07000551		05000952	06014852	07000481	
05000029	06015164	07001840		05000203	06014903	07000921		05000569	06014864	07000659		05000765	06014890	07000547		05000956	06014853	07000480	
05000032	06015164	07001840		05000207	06014903	07000919		05000576	06014863	07000656		05000770	06014891	07000547		05000960	06014853	07000480	
05000036	06015146	07001805		05000210	06014903	07000916		05000581	06014862	07000653		05000774	06014891	07000545		05000966	06014854	07000479	
05000041	06015121	07001740		05000214	06014901	07000914		05000583	06014862	07000649		05000779	06014891	07000540		05000971	06014855	07000479	
05000046	06015093	07001642		05000222	06014897	07000893		05000587	06014861	07000647		05000786	06014891	07000538		05000975	06014855	07000479	
05000049	06015069	07001577		05000235	06014896	07000890		05000591	06014861	07000646		05000788	06014891	07000537		05000979	06014856	07000479	
05000053	06015023	07001441		05000238	06014896	07000887		05000595	06014861	07000643		05000791	06014891	07000536		05000983	06014857	07000478	
05000057	06015007	07001350		05000242	06014894	07000882		05000601	06014860	07000640		05000794	06014891	07000535		05000989	06014857	07000478	
05000061	06014991	07001295		05000244	06014893	07000874		05000605	06014860	07000638		05000799	06014891	07000533		05000993	06014857	07000478	
05000066	06014981	07001252		05000251	06014894	07000873		05000610	06014860	07000631		05000801	06014891	07000529		05000996	06014858	07000477	
05000070	06014980	07001231		05000259	06014892	07000861		05000618	06014859	07000629		05000816	06014890	07000528		05001000	06014859	07000476	
05000075	06014979	07001224		05000269	06014892	07000856		05000622	06014859	07000626		05000821	06014891	07000527		05001005	06014859	07000476	
05000079	06014976	07001211		05000272	06014891	07000851		05000626	06014857	07000622		05000825	06014891	07000526		05001009	06014860	07000476	
05000084	06014971	07001198		05000280	06014891	07000847		05000631	06014858	07000619		05000833	06014891	07000521		05001015	06014860	07000476	
05000089	06014963	07001180		05000287	06014891	07000842		05000636	06014858	07000617		05000839	06014891	07000516		05001020	06014861	07000476	
05000094	06014961	07001157		05000293	06014890	07000839		05000641	06014858	07000614		05000844	06014891	07000515		05001023	06014862	07000475	
05000098	06014957	07001150		05000300	06014890	07000836		05000646	06014858	07000611		05000847	06014891	07000514		05001029	06014862	07000475	
05000103	06014952	07001125		05000307	06014890	07000832		05000650	06014858	07000613		05000852	06014891	07000510		05001033	06014863	07000476	
05000108	06014949	07001111		05000316	06014890	07000828		05000654	06014857	07000610		05000855	06014891	07000509		05001037	06014864	07000476	
05000113	06014945	07001101		05000323	06014890	07000825		05000659	06014857	07000608		05000858	06014891	07000508		05001043	06014865	07000475	
05000117	06014944	07001087		05000330	06014890	07000821		05000661	06014857	07000607		05000863	06014891	07000506		05001047	06014866	07000475	
05000123	06014941	07001081		05000336	06014890	07000817		05000666	06014857	07000604		05000868	06014891	07000505		05001052	06014866	07000474	
05000128	06014937	07001065		05000340	06014880	07000793		05000672	06014856	07000601		05000872	06014891	07000504		05001056	06014867	07000473	
05000133	06014933	07001051		05000360	06014877	07000782		05000677	06014855	07000596		05000878	06014891	07000500		05001060	06014867	07000473	
05000136	06014930	07001037		05000365	06014876	07000776		05000681	06014856	07000594		05000883	06014891	07000499		05001069	06014868	07000473	
05000142	06014927	07001026		05000375	06014878	07000775		05000686	06014856	07000592		05000887	06014891	07000498		05001072	06014868	07000473	
05000146	06014926	07001019		05000380	06014877	07000774		05000690	06014855	07000590		05000893	06014891	07000495		05001076	06014869	07000472	
05000150	06014926	07001016		05000394	06014876	07000764		05000702	06014855	07000585		05000896	06014891	07000493		05001080	06014870	07000472	
05000154	06014922	07001004		05000398	06014876	07000761		05000706	06014855	07000584		05000900	06014891	07000492		05001088	06014871	07000472	
05000157	06014920	07000998		05000401	06014875	07000753		05000711	06014855	07000582		05000907	06014891	07000491		05001092	06014871	07000472	
05000160	06014917	07000989		05000412	06014875	07000753		05000716	06014855	07000580		05000912	06014891	07000489		05001095	06014871	07000473	
05000164	06014915	07000972		05000417	06014875	07000752		05000721	06014855	07000576		05000916	06014891	07000488					
05000168	06014915	07000972		05000435	06014874	07000741		05000725	06014854	07000574		05000921	06014891	07000486					
05000172	06014915	07000972		05000445	06014873	07000734		05000730	06014853	07000572									
05000175	06014911	07000963		05000449	06014871	07000731													
05000179	06014909	07000953		05000457	06014869	07000722													
				05000464	06014870	07000713													
				05000471	06014870	07000710													
				05000483	06014869	07000707													
				05000495	06014867	07000698													
				05000512	06014866	07000689													
				05000520	06014866	07000684													
				05000528	06014866	07000682													
				05000532	06014865	07000681													

STATION 2B DATE 11 NOV, 1966 TIME 07:16Z LOCATION 33°05.5'N × 118°33.0'W CRUISE 056610



# RAMSAY PROBE DATA

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
0500001	06015156	07001821		05000250	06014902	07000907	
0500002	06015156	07001822		05000252	06014901	07000905	
0500004	06015157	07001821		05000256	06014902	07000905	
0500006	06015157	07001822		05000260	06014901	07000904	
0500008	06015158	07001821		05000265	06014900	07000898	
0500011	06015157	07001822		05000269	06014901	07000897	
0500013	06015158	07001822		05000272	06014900	07000896	
0500018	06015159	07001822		05000277	06014900	07000891	
0500021	06015160	07001822		05000279	06014901	07000891	
0500025	06015159	07001821		05000283	06014902	07000892	
0500027	06015154	07001815		05000286	06014901	07000890	
0500030	06015146	07001787		05000291	06014902	07000888	
0500034	06015137	07001759		05000295	06014901	07000886	
0500043	06015134	07001733		05000299	06014900	07000883	
0500044	06015124	07001720		05000302	06014900	07000880	
0500051	06015029	07001414		05000305	06014900	07000879	
0500055	06015028	07001391		05000309	06014900	07000877	
0500060	06015016	07001378		05000313	06014900	07000874	
0500064	06014999	07001320		05000318	06014899	07000871	
0500067	06014995	07001280		05000323	06014898	07000869	
0500071	06014996	07001276		05000326	06014896	07000860	
0500074	06014991	07001271		05000328	06014895	07000855	
0500079	06014986	07001249		05000332	06014894	07000852	
0500083	06014976	07001222		05000335	06014892	07000846	
0500087	06014969	07001197		05000340	06014892	07000842	
0500125	06014960	07001158		05000343	06014891	07000839	
0500128	06014954	07001140		05000348	06014891	07000837	
0500132	06014949	07001117		05000352	06014890	07000832	
0500138	06014948	07001105		05000355	06014890	07000829	
0500140	06014946	07001098		05000358	06014888	07000826	
0500144	06014945	07001093		05000362	06014887	07000821	
0500147	06014941	07001082		05000366	06014885	07000816	
0500151	06014939	07001074		05000369	06014883	07000808	
0500155	06014935	07001061		05000374	06014881	07000801	
0500160	06014932	07001045		05000378	06014878	07000792	
0500164	06014928	07001033		05000383	06014877	07000785	
0500167	06014925	07001021		05000385	06014877	07000783	
0500171	06014923	07001008		05000386	06014877	07000782	
0500175	06014922	07001005					
0500178	06014923	07001004					
0500181	06014919	07000998					
0500187	06014916	07000983					
0500190	06014915	07000976					
0500194	06014914	07000974					
0500197	06014913	07000967					
0500201	06014912	07000962					
0500204	06014910	07000956					
0500208	06014910	07000953					
0500212	06014910	07000950					
0500217	06014910	07000948					
0500220	06014909	07000944					
0500224	06014909	07000941					
0500227	06014905	07000938					
0500231	06014904	07000927					
0500235	06014901	07000922					
0500239	06014900	07000910					
0500243	06014902	07000909					
0500247	06014901	07000910					

STATION  
3A

DATE  
11 NOV, 1966

TIME  
08:24Z

LOCATION  
33°02.1'N × 118°32.9'W

CRUISE  
056610

## RAMSAY PROBE DATA

DEPTH (M)	SD. VEL. (M/S)	TEMP. C°	DEPTH (M)	SD. VEL. (M/S)	TEMP. C°	DEPTH (M)	SD. VEL. (M/S)	TEMP. C°
05000001	06015153	07001810	05000265	06014900	07000883	05000564	06014865	07000663
05000002	06015153	07001810	05000269	06014900	07000880	05000568	06014865	07000659
05000004	06015153	07001810	05000275	06014901	07000879	05000573	06014863	07000656
05000007	06015154	07001811	05000280	06014900	07000875	05000578	06014862	07000648
05000011	06015155	07001810	05000285	06014901	07000872	05000583	06014863	07000646
05000015	06015155	07001810	05000291	06014901	07000871	05000588	06014863	07000645
05000019	06015156	07001811	05000296	06014898	07000867	05000592	06014863	07000644
05000022	06015157	07001811	05000302	06014896	07000857	05000597	06014863	07000642
05000026	06015156	07001810	05000306	06014895	07000850	05000602	06014863	07000641
05000030	06015152	07001803	05000312	06014893	07000845	05000607	06014863	07000639
05000034	06015141	07001768	05000317	06014892	07000837	05000613	06014862	07000634
05000038	06015130	07001739	05000322	06014889	07000831	05000617	06014861	07000632
05000042	06015092	07001650	05000327	06014885	07000819	05000622	06014860	07000626
05000047	06015054	07001522	05000333	06014884	07000809	05000626	06014859	07000621
05000055	06015021	07001371	05000338	06014882	07000803	05000632	06014857	07000616
05000064	06014984	07001265	05000344	06014879	07000794	05000637	06014857	07000611
05000068	06014974	07001230	05000349	06014878	07000786	05000641	06014856	07000608
05000072	06014968	07001200	05000354	06014875	07000779	05000646	06014857	07000605
05000077	06014966	07001180	05000360	06014874	07000773	05000651	06014856	07000604
05000081	06014965	07001174	05000365	06014874	07000768	05000656	06014855	07000600
05000085	06014964	07001168	05000370	06014873	07000763	05000661	06014855	07000598
05000089	06014959	07001156	05000375	06014874	07000762	05000665	06014856	07000596
05000094	06014954	07001139	05000380	06014873	07000759	05000670	06014855	07000593
05000098	06014945	07001113	05000386	06014873	07000756	05000676	06014855	07000591
05000102	06014940	07001086	05000389	06014872	07000752	05000680	06014856	07000590
05000106	06014940	07001077	05000395	06014870	07000746	05000686	06014855	07000588
05000110	06014939	07001075	05000399	06014870	07000742			
05000114	06014938	07001070	05000405	06014869	07000738			
05000118	06014936	07001062	05000409	06014869	07000735			
05000122	06014930	07001049	05000415	06014870	07000734			
05000126	06014927	07001031	05000419	06014869	07000731			
05000130	06014925	07001024	05000425	06014869	07000730			
05000134	06014923	07001015	05000429	06014869	07000726			
05000138	06014922	07001009	05000435	06014868	07000724			
05000143	06014918	07000997	05000440	06014868	07000720			
05000146	06014918	07000987	05000445	06014868	07000719			
05000151	06014917	07000985	05000449	06014869	07000717			
05000155	06014916	07000979	05000454	06014869	07000715			
05000159	06014915	07000974	05000459	06014868	07000713			
05000164	06014913	07000970	05000465	06014868	07000708			
05000168	06014910	07000960	05000470	06014868	07000706			
05000173	06014910	07000953	05000474	06014868	07000704			
05000178	06014911	07000954	05000480	06014868	07000702			
05000182	06014910	07000948	05000484	06014868	07000700			
05000188	06014910	07000947	05000489	06014868	07000698			
05000192	06014910	07000943	05000494	06014868	07000697			
05000197	06014910	07000942	05000499	06014868	07000695			
05000202	06014909	07000938	05000504	06014868	07000694			
05000208	06014907	07000932	05000508	06014868	07000692			
05000213	06014906	07000925	05000514	06014868	07000691			
05000218	06014906	07000916	05000519	06014867	07000686			
05000223	06014908	07000922	05000523	06014867	07000684			
05000228	06014908	07000923	05000529	06014867	07000682			
05000233	06014907	07000916	05000534	06014867	07000678			
05000238	06014905	07000909	05000538	06014866	07000675			
05000244	06014902	07000901	05000544	06014867	07000673			
05000249	06014902	07000893	05000548	06014866	07000670			
05000253	06014901	07000891	05000553	06014865	07000666			
05000259	06014901	07000888	05000558	06014866	07000665			

STATION

4 A

DATE

11 NOV, 1966

TIME

08:59Z

LOCATION

33°00.9'N × 118°31.4'W

CRUISE

056610



## RAMSAY PROBE DATA

DEPTH SD. VEL. TEMP.			DEPTH SD. VEL. TEMP.			DEPTH SD. VEL. TEMP.			DEPTH SD. VEL. TEMP.			DEPTH SD. VEL. TEMP.			DEPTH SD. VEL. TEMP.			DEPTH SD. VEL. TEMP.					
(M)	(M/S)	°C	(M)	(M/S)	°C	(M)	(M/S)	°C	(M)	(M/S)	°C	(M)	(M/S)	°C	(M)	(M/S)	°C	(M)	(M/S)	°C	(M)	(M/S)	°C
05000001	06015135	07001817	05000002	06015135	07001818	05000003	06015135	07001819	05000004	06015135	07001820	05000005	06015135	07001821	05000006	06015135	07001822	05000007	06015135	07001823	05000008	06015135	07001824
05000009	06015135	07001825	05000010	06015135	07001826	05000011	06015135	07001827	05000012	06015135	07001828	05000013	06015135	07001829	05000014	06015135	07001830	05000015	06015135	07001831	05000016	06015135	07001832
05000017	06015135	07001833	05000018	06015135	07001834	05000019	06015135	07001835	05000020	06015135	07001836	05000021	06015135	07001837	05000022	06015135	07001838	05000023	06015135	07001839	05000024	06015135	07001840
05000025	06015135	07001841	05000026	06015135	07001842	05000027	06015135	07001843	05000028	06015135	07001844	05000029	06015135	07001845	05000030	06015135	07001846	05000031	06015135	07001847	05000032	06015135	07001848
05000033	06015135	07001849	05000034	06015135	07001850	05000035	06015135	07001851	05000036	06015135	07001852	05000037	06015135	07001853	05000038	06015135	07001854	05000039	06015135	07001855	05000040	06015135	07001856
05000041	06015135	07001857	05000042	06015135	07001858	05000043	06015135	07001859	05000044	06015135	07001900	05000045	06015135	07001901	05000046	06015135	07001902	05000047	06015135	07001903	05000048	06015135	07001904
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STATION	DATE	TIME	LOCATION	CRUISE
4B	11 NOV, 1966	09:52Z	33° 02.7'N × 118° 30.0'W	056610



# RAMSAY PROBE DATA

DEPTH	SD.	VEL.	TEMP.	DEPTH	SD.	VEL.	TEMP.	DEPTH	SD.	VEL.	TEMP.	DEPTH	SD.	VEL.	TEMP.	DEPTH	SD.	VEL.	TEMP.
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# RAMSAY PROBE DATA

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(M)	(M/S)	(M/S)	(C)	(M)	(M/S)	(M/S)	(C)	(M)	(M/S)	(M/S)	(C)	(M)	(M/S)	(M/S)	(C)	(M)	(M/S)	(M/S)	(C)
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0900082	06015166	07001023		0900108	06014862	07000728		0900115	06014861	07000591		0900122	06014861	07000469		0900129	06014861	07000346	
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0900097	06015166	07001020		0900123	06014859	07000725		0900130	06014858	07000588		0900137	06014858	07000466		0900144	06014858	07000343	
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0900107	06015166	07001018		0900133	06014857	07000723		0900140	06014856	07000586		0900147	06014856	07000464		0900154	06014856	07000341	
0900112	06015166	07001017		0900138	06014856	07000722		0900145	06014855	07000585		0900152	06014855	07000463		0900159	06014855	07000340	
0900117	06015166	07001016		0900143	06014855	07000721		0900150	06014854	07000584		0900157	06014854	07000462		0900164	06014854	07000339	
0900122	06015166	07001015		0900148	06014854	07000720		0900155	06014853	07000583		0900162	06014853	07000461		0900169	06014853	07000338	
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0900137	06015166	07001012		0900163	06014851	07000717		0900170	06014850	07000580		0900177	06014850	07000458		0900184	06014850	07000335	
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0900167	06015166	07001006		0900193	06014845	07000711		0900200	06014844	07000574		0900207	06014844	07000452		0900214	06014844	07000329	
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0900197	06015166	07001000		0900223	06014839	07000705		0900230	06014838	07000568		0900237	06014838	07000446		0900244	06014838	07000323	
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0900207	06015166	07000998		0900233	06014837	07000703		0900240	06014836	07000566		0900247	06014836	07000444		0900254	06014836	07000321	
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## RAMSAY PROBE DATA

DEPTH SD. VEL. TEMP.

(M) (M/S) C°  
 05000004 06015164 07001822  
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 05000014 06015167 07001823  
 05000026 06015139 07001762  
 05000031 06015127 07001712  
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 05000040 06015060 07001508  
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DEPTH SD. VEL. TEMP.

(M) (M/S) C°  
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DEPTH SD. VEL. TEMP.

(M) (M/S) C°  
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DEPTH SD. VEL. TEMP.

(M) (M/S) C°  
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 05000871 06014860 07001261

DEPTH SD. VEL.

(M) (M/S)  
 05000876 06014861  
 05000881 06014861  
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 05000985 06014869  
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 05000995 06014869  
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STATION  
4DDATE  
11 NOV, 1966TIME  
13:48ZLOCATION  
33°05.5'N × 118°25.0'WCRUISE  
056610



## RAMSAY PROBE DATA

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
05000000	06015162	07001814	
05000002	06015163	07001813	
05000007	06015163	07001813	
05000012	06015164	07001812	
05000019	06015163	07001813	
05000024	06015149	07001810	
05000030	06015093	07001690	
05000036	06015064	07001535	
05000041	06015053	07001480	
05000046	06015021	07001391	
05000051	06015004	07001335	
05000057	06014985	07001259	
05000063	06014976	07001212	
05000068	06014975	07001193	
05000072	06014969	07001183	
05000077	06014968	07001162	
05000086	06014961	07001149	
05000093	06014953	07001125	
05000098	06014948	07001092	
05000104	06014937	07001070	
05000109	06014933	07001040	
05000114	06014930	07001030	
05000118	06014931	07001024	
05000122	06014928	07001017	
05000128	06014926	07001007	
05000134	06014925	07000996	
05000139	06014923	07000992	
05000144	06014923	07000983	
05000149	06014921	07000976	
05000153	06014918	07000966	
05000158	06014916	07000960	
05000164	06014912	07000947	
05000168	06014912	07000940	
05000174	06014912	07000934	
05000180	06014910	07000932	
05000185	06014909	07000922	
05000190	06014908	07000921	
05000196	06014906	07000910	
05000200	06014904	07000905	
05000204	06014900	07000892	
05000210	06014900	07000884	
05000215	06014904	07000891	
05000220	06014901	07000886	
05000225	06014897	07000875	
05000230	06014896	07000867	
05000236	06014894	07000856	
05000241	06014896	07000855	

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
05000245	06014893	07000853	
05000250	06014892	07000846	
05000254	06014892	07000842	
05000260	06014891	07000839	
05000265	06014891	07000834	
05000271	06014890	07000830	
05000277	06014889	07000825	
05000282	06014889	07000822	
05000287	06014890	07000822	
05000291	06014889	07000820	
05000295	06014889	07000817	
05000300	06014889	07000813	
05000305	06014887	07000807	
05000311	06014887	07000803	
05000317	06014887	07000801	
05000322	06014887	07000798	
05000327	06014887	07000795	
05000331	06014887	07000793	
05000336	06014884	07000787	
05000340	06014883	07000780	
05000345	06014883	07000777	
05000350	06014882	07000772	
05000356	06014880	07000767	
05000361	06014880	07000764	
05000367	06014879	07000758	
05000372	06014879	07000756	
05000378	06014880	07000753	
05000383	06014880	07000751	
05000388	06014880	07000751	
05000392	06014880	07000750	
05000397	06014881	07000749	
05000404	06014879	07000745	
05000408	06014879	07000741	
05000413	06014876	07000734	
05000417	06014875	07000728	
05000424	06014874	07000720	
05000429	06014872	07000716	
05000434	06014872	07000711	
05000438	06014870	07000708	
05000442	06014870	07000701	
05000447	06014869	07000698	
05000452	06014869	07000695	
05000457	06014869	07000692	
05000462	06014868	07000691	
05000468	06014868	07000687	
05000474	06014868	07000683	
05000479	06014868	07000681	

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
05000484	06014867	07000677	
05000488	06014866	07000674	
05000493	06014867	07000673	
05000497	06014866	07000669	
05000502	06014866	07000665	
05000508	06014866	07000663	
05000514	06014865	07000660	
05000519	06014864	07000657	
05000525	06014864	07000651	
05000530	06014863	07000648	
05000534	06014863	07000645	
05000539	06014862	07000641	
05000543	06014862	07000639	
05000548	06014862	07000637	
05000554	06014863	07000635	
05000559	06014862	07000633	
05000565	06014863	07000632	
05000571	06014862	07000628	
05000576	06014859	07000622	
05000580	06014857	07000615	
05000585	06014858	07000612	
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05000594	06014858	07000607	
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05000603	06014857	07000602	
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05000620	06014856	07000593	
05000625	06014855	07000589	
05000631	06014854	07000586	
05000636	06014853	07000582	
05000640	06014853	07000578	
05000644	06014853	07000574	
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05000654	06014852	07000570	
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05000676	06014850	07000557	
05000681	06014850	07000555	
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05000691	06014850	07000550	
05000696	06014849	07000547	
05000701	06014850	07000544	
05000705	06014850	07000543	
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05000715	06014850	07000539	
05000719	06014849	07000537	

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
05000724	06014849	07000534	
05000730	06014849	07000532	
05000736	06014849	07000527	
05000741	06014849	07000526	
05000746	06014848	07000524	
05000752	06014848	07000519	
05000756	06014847	07000518	
05000762	06014848	07000515	
05000765	06014848	07000513	
05000771	06014848	07000512	
05000775	06014847	07000510	
05000779	06014847	07000506	
05000785	06014846	07000504	
05000790	06014846	07000502	
05000796	06014845	07000498	
05000802	06014844	07000492	
05000807	06014844	07000490	
05000813	06014845	07000489	
05000818	06014844	07000486	
05000823	06014843	07000482	
05000828	06014843	07000478	
05000832	06014843	07000475	
05000836	06014843	07000474	
05000841	06014843	07000472	
05000846	06014841	07000470	
05000851	06014842	07000466	
05000856	06014843	07000466	
05000862	06014843	07000464	
05000868	06014843	07000462	
05000873	06014843	07000460	
05000879	06014843	07000459	
05000883	06014844	07000458	
05000889	06014845	07000459	
05000893	06014845	07000457	
05000897	06014845	07000458	
05000902	06014846	07000457	
05000907	06014847	07000456	
05000912	06014847	07000455	
05000918	06014848	07000455	
05000924	06014849	07000454	
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05000939	06014850	07000453	
05000944	06014851	07000453	
05000948	06014852	07000452	
05000953	06014852	07000451	
05000957	06014853	07000451	
05000962	06014854	07000451	

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
05000967	06014855	07000451	
05000973	06014855	07000450	
05000978	06014856	07000450	
05000984	06014856	07000450	
05000989	06014857	07000449	
05000994	06014858	07000449	
05001000	06014858	07000449	
05001004	06014860	07000448	
05001009	06014860	07000448	
05001013	06014860	07000447	
05001017	06014861	07000448	
05001022	06014862	07000448	

DOWN SAMPLING ONLY STATION

STATION  
4EDATE  
11 NOV, 1966TIME  
15:45ZLOCATION  
33°07.2'N × 118°22.8'WCRUISE  
056610

## RAMSAY PROBE DATA

DEPTH	SD.	VEL.	TEMP.	DEPTH	SD.	VEL.	TEMP.	DEPTH	SD.	VEL.	TEMP.	DEPTH	SD.	VEL.	TEMP.	DEPTH	SD.	VEL.	TEMP.	
(M)	(M/S)	C°	(M)	(M/S)	C°	(M)	(M/S)	C°	(M)	(M/S)	C°	(M)	(M/S)	C°	(M)	(M/S)	C°	(M)	(M/S)	C°
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05000015	06015164	07001816	05000253	06014903	07000871	05000492	06014865	07000678	05000687	06014848	07000594	05000902	06014847	07000464	05001097	06014847	07000375	05001302	06014846	07000286
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05000025	06015039	07001419	05000261	06014901	07000860	05000502	06014865	07000671	05000697	06014848	07000594	05000912	06014847	07000464	05001107	06014847	07000377	05001312	06014846	07000288
05000030	06015031	07001386	05000265	06014900	07000855	05000507	06014862	07000665	05000702	06014848	07000594	05000917	06014847	07000464	05001112	06014847	07000378	05001317	06014846	07000289
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05000040	06015008	07001307	05000273	06014896	07000844	05000517	06014861	07000659	05000712	06014847	07000593	05000927	06014847	07000464	05001122	06014847	07000380	05001327	06014846	07000291
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05000070	06014957	07001234	05000297	06014897	07000813	05000547	06014861	07000653	05000742	06014847	07000593	05000957	06014847	07000464	05001152	06014847	07000386	05001357	06014846	07000297
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05000085	06014927	07001198	05000309	06014897	07000798	05000562	06014861	07000650	05000757	06014847	07000593	05000972	06014847	07000464	05001167	06014847	07000389	05001372	06014846	07000300
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05000095	06014907	07001174	05000317	06014897	07000788	05000572	06014861	07000648	05000767	06014847	07000593	05000982	06014847	07000464	05001177	06014847	07000391	05001382	06014846	07000302
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05000105	06014887	07001150	05000325	06014897	07000778	05000582	06014861	07000646	05000777	06014847	07000593	05000992	06014847	07000464	05001187	06014847	07000393	05001392	06014846	07000304
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05000115	06014867	07001126	05000333	06014897	07000768	05000592	06014861	07000644	05000787	06014847	07000593	05001002	06014847	07000464	05001197	06014847	07000395	05001402	06014846	07000306
05000120	06014857	07001114	05000337	06014897	07000763	05000597	06014861	07000643	05000792	06014847	07000593	05001007	06014847	07000464	05001202	06014847	07000396	05001407	06014846	07000307
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05000130	06014837	07001090	05000345	06014897	07000753	05000607	06014861	07000641	05000802	06014847	07000593	05001017	06014847	07000464	05001212	06014847	07000398	05001417	06014846	07000309
05000135	06014827	07001078	05000349	06014897	07000748	05000612	06014861	07000640	05000807	06014847	07000593	05001022	06014847	07000464	05001217	06014847	07000399	05001422	06014846	07000310
05000140	06014817	07001066	05000353	06014897	07000743	05000617	06014861	07000639	05000812	06014847	07000593	05001027	06014847	07000464	05001222	06014847	07000400	05001427	06014846	07000311
05000145	06014807	07001054	05000357	06014897	07000738	05000622	06014861	07000638	05000817	06014847	07000593	05001032	06014847	07000464	05001227	06014847	07000401	05001432	06014846	07000312
05000150	06014797	07001042	05000361	06014897	07000733	05000627	06014861	07000637	05000822	06014847	07000593	05001037	06014847	07000464	05001232	06014847	07000402	05001437	06014846	07000313
05000155	06014787	07001030	05000365	06014897	07000728	05000632	06014861	07000636	05000827	06014847	07000593	05001042	06014847	07000464	05001237	06014847	07000403	05001442	06014846	07000314
05000160	06014777	07001018	05000369	06014897	07000723	05000637	06014861	07000635	05000832	06014847	07000593	05001047	06014847	07000464	05001242	06014847	07000404	05001447	06014846	07000315
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05000170	06014757	07000994	05000377	06014897	07000713	05000647	06014861	07000633	05000842	06014847	07000593	05001057	06014847	07000464	05001252	06014847	07000406	05001457	06014846	07000317
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05000205	06014687	07000910	05000405	06014897	07000678	05000682	06014861	07000626	05000877	06014847	07000593	05001092	06014847	07000464	05001287	06014847	07000413	05001492	06014846	07000324
05000210	06014677	07000898	05000409	06014897	07000673	05000687	0601486													



## RAMSAY PROBE DATA

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
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05000001	06015165	07001830		05000221	06014902	07000881		05000432	06014872	07000712		05000633	06014848	07000568	
05000003	06015166	07001830		05000226	06014904	07000886		05000436	06014870	07000708		05000638	06014846	07000563	
05000008	06015165	07001830		05000231	06014904	07000885		05000440	06014869	07000702		05000642	06014847	07000561	
05000013	06015164	07001820		05000236	06014904	07000883		05000444	06014868	07000697		05000646	06014847	07000561	
05000018	06015165	07001818		05000240	06014904	07000880		05000448	06014867	07000693		05000650	06014848	07000560	
05000021	06015165	07001816		05000244	06014902	07000876		05000452	06014867	07000691		05000656	06014849	07000560	
05000025	06015154	07001814		05000248	06014901	07000871		05000457	06014866	07000689		05000661	06014848	07000558	
05000030	06015134	07001743		05000251	06014900	07000863		05000461	06014866	07000686		05000665	06014848	07000555	
05000035	06015100	07001686		05000255	06014898	07000861		05000467	06014866	07000682		05000670	06014847	07000553	
05000038	06015066	07001531		05000260	06014895	07000851		05000470	06014866	07000680		05000673	06014847	07000549	
05000043	06015040	07001466		05000265	06014894	07000844		05000476	06014866	07000678		05000677	06014848	07000549	
05000047	06015030	07001395		05000269	06014892	07000837		05000480	06014865	07000674		05000681	06014848	07000548	
05000052	06015007	07001339		05000274	06014894	07000837		05000483	06014864	07000671		05000686	06014849	07000547	
05000056	06014992	07001268		05000278	06014893	07000839		05000487	06014863	07000666		05000691	06014849	07000547	
05000061	06014982	07001250		05000282	06014893	07000834		05000491	06014860	07000660		05000695	06014849	07000547	
05000066	06014969	07001238		05000286	06014895	07000832		05000496	06014859	07000652		05000700	06014851	07000546	
05000071	06014963	07001220		05000290	06014893	07000830		05000500	06014859	07000649		05000704	06014850	07000545	
05000078	06014971	07001198		05000294	06014892	07000823		05000504	06014857	07000646		05000709	06014850	07000545	
05000083	06014966	07001163		05000299	06014889	07000819		05000509	06014857	07000640		05000710	06014849	07000540	
05000087	06014955	07001135		05000303	06014889	07000812		05000515	06014857	07000639		05000716	06014848	07000537	
05000092	06014951	07001105		05000308	06014888	07000807		05000519	06014857	07000637		05000721	06014848	07000533	
05000095	06014949	07001097		05000314	06014886	07000802		05000523	06014858	07000636		05000725	06014849	07000533	
05000099	06014944	07001079		05000318	06014885	07000796		05000529	06014857	07000633		05000729	06014849	07000533	
05000105	06014941	07001071		05000322	06014885	07000794		05000531	06014856	07000631		05000734	06014849	07000531	
05000109	06014934	07001049		05000327	06014885	07000790		05000535	06014856	07000626		05000738	06014848	07000529	
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05000131	06014925	07001001		05000346	06014882	07000773		05000558	06014852	07000607		05000760	06014847	07000515	
05000135	06014923	07000992		05000352	06014883	07000772		05000563	06014852	07000607		05000764	06014849	07000511	
05000140	06014922	07000985		05000358	06014882	07000771		05000567	06014850	07000602		05000768	06014846	07000509	
05000145	06014919	07000977		05000361	06014882	07000769		05000570	06014850	07000598		05000772	06014846	07000509	
05000148	06014920	07000970		05000366	06014881	07000765		05000574	06014851	07000596		05000776	06014846	07000507	
05000153	06014920	07000970		05000369	06014882	07000762		05000579	06014850	07000595		05000781	06014846	07000505	
05000156	06014919	07000968		05000373	06014881	07000760		05000583	06014851	07000594		05000786	06014847	07000504	
05000161	06014916	07000960		05000378	06014881	07000758		05000587	06014851	07000594		05000790	06014848	07000504	
05000166	06014915	07000950		05000382	06014881	07000756		05000593	06014851	07000593		05000794	06014847	07000503	
05000170	06014913	07000944		05000387	06014881	07000754		05000597	06014852	07000592		05000799	06014847	07000501	
05000175	06014908	07000932		05000392	06014881	07000753		05000600	06014851	07000589		05000803	06014845	07000498	
05000179	06014903	07000916		05000396	06014880	07000749		05000604	06014850	07000586		05000807	06014845	07000494	
05000182	06014902	07000908		05000401	06014879	07000745		05000607	06014850	07000584		05000811	06014845	07000491	
05000187	06014903	07000904		05000406	06014878	07000742		05000612	06014850	07000581					
05000192	06014903	07000904		05000410	06014877	07000737		05000617	06014850	07000579					
05000201	06014901	07000894		05000414	06014877	07000732		05000621	06014850	07000578					
05000205	06014902	07000892		05000417	06014875	07000728		05000626	06014849	07000574					
05000209	06014902	07000890		05000422	06014874	07000722									
05000213	06014901	07000889													

STATION

5F

DATE

12 NOV, 1966

TIME

04:01Z

LOCATION

33°03.4'N × 118°21.0'W

CRUISE

056610



## RAMSAY PROBE DATA

DEPTH SD. VEL. TEMP.  
(M) (M/S) C°

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05000064 06014982 07001225  
05000069 06014972 07001213  
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05000078 06014963 07001144  
05000082 06014961 07001142  
05000086 06014957 07001125  
05000090 06014950 07001113  
05000096 06014948 07001091  
05000099 06014950 07001088  
05000105 06014950 07001088  
05000107 06014945 07001085  
05000111 06014943 07001064  
05000115 06014942 07001063  
05000120 06014938 07001051  
05000126 06014930 07001025  
05000130 06014929 07001013  
05000134 06014928 07001008  
05000138 06014926 07001000  
05000142 06014924 07000992  
05000146 06014922 07000985  
05000147 06014922 07000979  
05000148 06014922 07000979  
05000151 06014920 07000976  
05000155 06014919 07000970  
05000160 06014919 07000964  
05000164 06014918 07000960  
05000168 06014917 07000954  
05000172 06014915 07000949  
05000178 06014914 07000944  
05000182 06014911 07000940  
05000187 06014908 07000933  
05000191 06014906 07000918  
05000195 06014903 07000907  
05000198 06014902 07000900  
05000202 06014902 07000894  
05000207 06014902 07000894  
05000211 06014901 07000889  
05000216 06014901 07000885  
05000219 06014897 07000883  
05000224 06014896 07000884  
05000228 06014901 07000873  
05000233 06014901 07000877  
05000236 06014901 07000874

DEPTH SD. VEL. TEMP.  
(M) (M/S) C°

05000240 06014901 07000871  
05000245 06014899 07000868  
05000250 06014898 07000862  
05000254 06014895 07000857  
05000258 06014895 07000852  
05000261 06014896 07000846  
05000265 06014897 07000841  
05000270 06014896 07000847  
05000274 06014893 07000841  
05000280 06014891 07000830  
05000284 06014890 07000825  
05000286 06014890 07000822  
05000291 06014891 07000820  
05000293 06014891 07000819  
05000294 06014890 07000819  
05000295 06014891 07000818  
05000296 06014889 07000818  
05000301 06014888 07000812  
05000304 06014888 07000808  
05000309 06014886 07000802  
05000312 06014882 07000795  
05000316 06014879 07000782  
05000322 06014879 07000779  
05000326 06014879 07000777  
05000331 06014879 07000775  
05000335 06014879 07000770  
05000339 06014880 07000771  
05000343 06014880 07000770  
05000348 06014881 07000770  
05000353 06014880 07000767  
05000357 06014880 07000765  
05000361 06014880 07000763  
05000366 06014881 07000762  
05000369 06014879 07000759  
05000374 06014877 07000752  
05000378 06014876 07000745  
05000382 06014875 07000739  
05000387 06014875 07000737  
05000390 06014874 07000736  
05000392 06014875 07000735  
05000393 06014875 07000734  
05000396 06014875 07000733  
05000400 06014875 07000733  
05000404 06014875 07000731  
05000406 06014875 07000729  
05000409 06014874 07000726  
05000412 06014874 07000725  
05000416 06014874 07000724  
05000419 06014875 07000723  
05000422 06014875 07000723  
05000427 06014874 07000721  
05000431 06014872 07000713  
05000434 06014872 07000711  
05000437 06014871 07000708  
05000440 06014870 07000706  
05000443 06014869 07000701  
05000447 06014867 07000697

DEPTH SD. VEL. TEMP.  
(M) (M/S) C°

05000451 06014866 07000689  
05000455 06014867 07000688  
05000458 06014867 07000687  
05000461 06014866 07000685  
05000465 06014866 07000683  
05000468 06014865 07000680  
05000473 06014864 07000675  
05000475 06014864 07000674  
05000479 06014864 07000672  
05000483 06014865 07000670  
05000486 06014864 07000669  
05000490 06014865 07000668  
05000492 06014864 07000667  
05000495 06014861 07000661  
05000499 06014860 07000653  
05000502 06014861 07000653  
05000506 06014861 07000652  
05000509 06014861 07000651  
05000513 06014861 07000649  
05000517 06014860 07000646  
05000522 06014858 07000640  
05000526 06014858 07000636  
05000529 06014857 07000633  
05000534 06014857 07000631  
05000537 06014856 07000626  
05000542 06014855 07000624  
05000547 06014854 07000619  
05000550 06014854 07000618  
05000555 06014854 07000615  
05000559 06014854 07000612  
05000562 06014854 07000611  
05000566 06014853 07000609  
05000569 06014852 07000604  
05000574 06014851 07000601  
05000579 06014851 07000597  
05000582 06014850 07000593  
05000586 06014849 07000590  
05000589 06014849 07000588

STATION  
5E

DATE  
12 NOV, 1966

TIME  
04:30Z

LOCATION  
33°01.5'N × 118°23.1'W

CRUISE  
056610

## RAMSAY PROBE DATA

DEPTH SD. VEL. TEMP.

(M)	(M/S)	C°
05000002	06015159	07001810
05000006	06015159	07001809
05000011	06015160	07001810
05000015	06015161	07001809
05000019	06015159	07001809
05000023	06015155	07001801
05000026	06015138	07001768
05000030	06015090	07001670
05000035	06015067	07001537
05000039	06015058	07001481
05000043	06015048	07001469
05000046	06015031	07001410
05000051	06015016	07001361
05000054	06015004	07001311
05000059	06014988	07001260
05000063	06014978	07001222
05000067	06014968	07001195
05000071	06014964	07001167
05000075	06014962	07001152
05000080	06014963	07001144
05000085	06014961	07001144
05000092	06014950	07001109
05000096	06014947	07001095
05000099	06014944	07001081
05000104	06014944	07001072
05000109	06014943	07001069
05000113	06014939	07001063
05000118	06014935	07001044
05000122	06014933	07001028
05000124	06014932	07001024
05000129	06014932	07001021
05000134	06014931	07001020
05000138	06014927	07001009
05000143	06014919	07000988
05000147	06014918	07000974
05000150	06014918	07000970
05000154	06014914	07000965
05000157	06014912	07000952
05000162	06014913	07000948
05000168	06014912	07000944
05000171	06014910	07000939
05000175	06014910	07000934

DEPTH SD. VEL. TEMP.

(M)	(M/S)	C°
05000178	06014908	07000927
05000183	06014907	07000924
05000187	06014902	07000912
05000192	06014902	07000899
05000200	06014901	07000900
05000212	06014902	07000888
05000216	06014902	07000892
05000221	06014901	07000887
05000225	06014902	07000887
05000229	06014901	07000884
05000234	06014901	07000882
05000237	06014902	07000878
05000241	06014900	07000878
05000245	06014895	07000867
05000249	06014891	07000850
05000252	06014890	07000845
05000257	06014893	07000843
05000261	06014898	07000849
05000265	06014900	07000858
05000270	06014900	07000858
05000273	06014900	07000856
05000277	06014899	07000852
05000282	06014898	07000849
05000286	06014897	07000846
05000290	06014896	07000840
05000294	06014895	07000838
05000298	06014886	07000811
05000305	06014883	07000803
05000309	06014882	07000796
05000314	06014880	07000790
05000319	06014880	07000783
05000323	06014882	07000786
05000327	06014882	07000787
05000330	06014882	07000784
05000333	06014881	07000781
05000338	06014881	07000778
05000342	06014881	07000776
05000347	06014880	07000774
05000352	06014878	07000767
05000356	06014877	07000760
05000362	06014878	07000758
05000366	06014876	07000757
05000370	06014875	07000750

DEPTH SD. VEL. TEMP.

(M)	(M/S)	C°
05000375	06014876	07000749
05000379	06014875	07000747
05000383	06014875	07000744
05000387	06014874	07000742
05000391	06014874	07000737
05000394	06014874	07000735
05000399	06014874	07000733
05000402	06014874	07000732
05000407	06014874	07000730
05000410	06014873	07000728
05000414	06014871	07000720
05000418	06014871	07000717
05000422	06014871	07000717
05000426	06014869	07000714
05000429	06014867	07000703
05000433	06014868	07000704
05000438	06014868	07000703
05000441	06014867	07000699
05000444	06014868	07000697
05000448	06014867	07000696
05000453	06014865	07000689
05000456	06014866	07000688
05000461	06014866	07000687
05000465	06014865	07000684
05000468	06014864	07000679
05000472	06014863	07000675
05000476	06014862	07000672
05000480	06014863	07000669
05000484	06014862	07000667
05000488	06014863	07000666
05000491	06014862	07000664
05000496	06014861	07000661
05000499	06014862	07000660
05000503	06014860	07000657
05000507	06014860	07000654
05000511	06014860	07000650
05000514	06014860	07000647
05000519	06014860	07000644
05000523	06014859	07000639
05000527	06014857	07000635
05000538	06014856	07000630

DEPTH SD. VEL. TEMP.

(M)	(M/S)	C°
05000541	06014856	07000628
05000546	06014856	07000625
05000550	06014855	07000621
05000553	06014855	07000620
05000557	06014856	07000619
05000562	06014856	07000618
05000566	06014856	07000618
05000570	06014856	07000617
05000575	06014857	07000616
05000578	06014855	07000613
05000584	06014855	07000609
05000589	06014854	07000605
05000593	06014855	07000604
05000599	06014855	07000602
05000603	06014855	07000600
05000607	06014853	07000598
05000611	06014853	07000592
05000615	06014853	07000591
05000619	06014854	07000590
05000623	06014853	07000588
05000629	06014853	07000586
05000633	06014853	07000584
05000638	06014853	07000580
05000641	06014852	07000578
05000646	06014851	07000574
05000649	06014851	07000572
05000653	06014851	07000569
05000659	06014851	07000568
05000663	06014851	07000565
05000667	06014851	07000564
05000672	06014851	07000563
05000676	06014850	07000559
05000679	06014849	07000555
05000683	06014848	07000553
05000687	06014849	07000551
05000692	06014849	07000550
05000697	06014850	07000548
05000701	06014850	07000548
05000706	06014850	07000547
05000711	06014850	07000545
05000715	06014850	07000543
05000733	06014850	07000537
05000738	06014850	07000536

DEPTH SD. VEL. TEMP.

(M)	(M/S)	C°
05000743	06014851	07000534
05000748	06014850	07000532
05000753	06014849	07000528
05000756	06014849	07000526
05000760	06014849	07000523
05000765	06014848	07000520
05000768	06014849	07000519
05000774	06014849	07000516
05000779	06014849	07000515
05000784	06014849	07000513
05000789	06014849	07000512
05000793	06014849	07000511
05000798	06014849	07000507
05000801	06014849	07000505
05000806	06014849	07000505
05000810	06014848	07000503
05000814	06014848	07000500
05000820	06014848	07000499
05000825	06014849	07000498
05000829	06014850	07000498
05000834	06014851	07000497
05000837	06014851	07000496
05000841	06014850	07000495
05000846	06014850	07000491
05000851	06014850	07000487
05000857	06014850	07000487
05000861	06014850	07000486
05000867	06014849	07000482
05000871	06014849	07000481
05000875	06014850	07000480
05000881	06014851	07000480
05000885	06014851	07000479
05000890	06014850	07000478
05000894	06014850	07000475
05000898	06014850	07000473
05000900	06014850	07000472
05000909	06014850	07000472

STATION

5D

DATE

12 NOV, 1966

TIME

05:17Z

LOCATION

33°00.2'N × 118°26.4'W

CRUISE

056610



## RAMSAY PROBE DATA

DEPTH SO.VEL. TEMP.

(M) (M/S) C°

05000001 06015153 07001790  
 05000007 06015152 07001789  
 05000010 06015149 07001777  
 05000016 06015147 07001767  
 05000020 06015138 07001750  
 05000025 06015114 07001692  
 05000029 06015082 07001613  
 05000033 06015067 07001516  
 05000037 06015047 07001481  
 05000041 06015034 07001404  
 05000046 06015014 07001371  
 05000051 06015011 07001312  
 05000056 06015002 07001304  
 05000061 06014981 07001247  
 05000066 06014973 07001199  
 05000070 06014968 07001177  
 05000073 06014966 07001163  
 05000077 06014961 07001149  
 05000082 06014959 07001133  
 05000086 06014953 07001121  
 05000090 06014950 07001102  
 05000094 06014945 07001092  
 05000099 06014940 07001069  
 05000104 06014940 07001061  
 05000109 06014938 07001054  
 05000112 06014937 07001048  
 05000116 06014933 07001042  
 05000122 06014929 07001024  
 05000125 06014927 07001011  
 05000130 06014926 07001004  
 05000134 06014922 07000996  
 05000138 06014921 07000986  
 05000142 06014919 07000981  
 05000147 06014916 07000966  
 05000152 06014916 07000964  
 05000157 06014916 07000960  
 05000161 06014916 07000956  
 05000165 06014914 07000952  
 05000169 06014913 07000945  
 05000174 06014911 07000941  
 05000178 06014911 07000934  
 05000182 06014912 07000932  
 05000186 06014910 07000930  
 05000191 06014907 07000922  
 05000196 06014907 07000914  
 05000200 06014903 07000905  
 05000204 06014901 07000897  
 05000209 06014900 07000891  
 05000212 06014899 07000886  
 05000218 06014899 07000883  
 05000222 06014900 07000881  
 05000227 06014900 07000880  
 05000230 06014900 07000876  
 05000234 06014898 07000875  
 05000239 06014898 07000870  
 05000243 06014896 07000864  
 05000248 06014896 07000859  
 05000253 06014896 07000858  
 05000257 06014896 07000855

DEPTH SO.VEL. TEMP.

(M) (M/S) C°

05000262 06014896 07000853  
 05000265 06014896 07000851  
 05000269 06014896 07000850  
 05000274 06014896 07000850  
 05000279 06014895 07000842  
 05000283 06014894 07000837  
 05000289 06014892 07000833  
 05000292 06014890 07000824  
 05000296 06014891 07000821  
 05000300 06014890 07000821  
 05000305 06014889 07000816  
 05000309 06014889 07000811  
 05000314 06014888 07000810  
 05000319 06014885 07000803  
 05000323 06014881 07000791  
 05000327 06014881 07000784  
 05000331 06014881 07000781  
 05000336 06014880 07000778  
 05000340 06014880 07000776  
 05000345 06014879 07000773  
 05000350 06014879 07000770  
 05000355 06014877 07000764  
 05000359 06014876 07000759  
 05000363 06014876 07000755  
 05000367 06014876 07000752  
 05000371 06014875 07000749  
 05000376 06014874 07000745  
 05000380 06014873 07000741  
 05000385 06014873 07000737  
 05000389 06014871 07000733  
 05000393 06014871 07000728  
 05000398 06014871 07000725  
 05000404 06014870 07000723  
 05000408 06014869 07000719  
 05000412 06014868 07000715  
 05000416 06014868 07000711  
 05000420 06014867 07000707  
 05000424 06014868 07000706  
 05000429 06014867 07000704  
 05000433 06014867 07000700  
 05000437 06014865 07000696  
 05000443 06014865 07000693  
 05000447 06014864 07000690  
 05000453 06014865 07000687  
 05000457 06014865 07000686  
 05000460 06014865 07000685  
 05000466 06014864 07000682  
 05000470 06014864 07000678  
 05000475 06014864 07000677  
 05000478 06014863 07000674  
 05000483 06014861 07000669  
 05000488 06014860 07000661  
 05000493 06014860 07000660  
 05000497 06014861 07000660  
 05000501 06014862 07000659  
 05000504 06014861 07000655  
 05000509 06014860 07000654  
 05000514 06014861 07000652

DEPTH SO.VEL. TEMP.

(M) (M/S) C°

05000519 06014861 07000650  
 05000524 06014861 07000647  
 05000525 06014861 07000646

STATION

5B

DATE

12 NOV, 1966

TIME

06:21Z

LOCATION

32° 58.5'N × 118° 30.1'W

CRUISE

056610



## RAMSAY PROBE DATA

DEPTH (M)	SD. VEL. (M/S)	TEMP. C°
05000000	06015152	07001799
05000002	06015150	07001787
05000007	06015135	07001750
05000012	06015107	07001675
05000016	06015089	07001621
05000020	06015071	07001540
05000024	06015058	07001496
05000029	06015048	07001496
05000033	06015042	07001428
05000038	06015033	07001398
05000042	06015021	07001368
05000047	06015013	07001331
05000051	06014996	07001301
05000055	06014989	07001245
05000059	06014979	07001232
05000064	06014975	07001202
05000069	06014967	07001177
05000074	06014961	07001151
05000078	06014958	07001134
05000084	06014953	07001120
05000087	06014950	07001105
05000092	06014947	07001090
05000096	06014944	07001082
05000099	06014939	07001065
05000103	06014937	07001056
05000108	06014936	07001045
05000112	06014935	07001043
05000117	06014932	07001033
05000122	06014930	07001023
05000127	06014930	07001017
05000130	06014927	07001012
05000135	06014925	07001001
05000138	06014924	07000992
05000142	06014922	07000989
05000147	06014920	07000980
05000153	06014917	07000970
05000157	06014916	07000962
05000162	06014916	07000958
05000166	06014914	07000954
05000169	06014915	07000948
05000173	06014915	07000948
05000177	06014914	07000943
05000182	06014912	07000937
05000186	06014912	07000935
05000191	06014910	07000928
05000196	06014909	07000922
05000201	06014908	07000917
05000205	06014908	07000912
05000209	06014906	07000907
05000213	06014906	07000903
05000217	06014900	07000893
05000221	06014899	07000879
05000226	06014896	07000875
05000231	06014895	07000867
05000236	06014895	07000863
05000236	06014895	07000863
05000235	06014895	07000862
05000236	06014895	07000862

STATION  
5ADATE  
12 NOV, 1966TIME  
06:52ZLOCATION  
32°58.4'N × 118°30.9'WCRUISE  
056610

## RAMSAY PROBE DATA

DEPTH (M)	SD. VEL. (M/S)	TEMP. C°	DEPTH (M)	SD. VEL. (M/S)	TEMP. C°	DEPTH (M)	SD. VEL. (M/S)	TEMP. C°	DEPTH (M)	SD. VEL. (M/S)	TEMP. C°
0500000	06015153	07001732	05000293	06014888	07000807	05000576	06014859	07000622	05000862	06014884	07000471
05000001	06015154	07001734	05000299	06014888	07000804	05000582	06014859	07000619	05000868	06014884	07000469
05000005	06015153	07001731	05000303	06014886	07000802	05000587	06014858	07000615	05000872	06014885	07000468
05000009	06015153	07001732	05000309	06014885	07000799	05000593	06014859	07000613	05000877	06014886	07000466
05000013	06015154	07001731	05000313	06014883	07000797	05000598	06014858	07000611	05000881	06014885	07000465
05000017	06015155	07001732	05000317	06014882	07000795	05000601	06014858	07000607	05000885	06014886	07000463
05000021	06015156	07001731	05000322	06014884	07000792	05000606	06014858	07000605	05000889	06014886	07000463
05000026	06015156	07001731	05000326	06014883	07000791	05000610	06014857	07000602	05000894	06014886	07000462
05000032	06015157	07001732	05000332	06014881	07000788	05000615	06014857	07000601	05000899	06014886	07000462
05000037	06015126	07001771	05000337	06014880	07000776	05000619	06014856	07000598	05000905	06014887	07000461
05000042	06015075	07001598	05000341	06014879	07000771	05000624	06014857	07000595	05000911	06014888	07000460
05000047	06015030	07001450	05000347	06014879	07000768	05000629	06014857	07000593	05000916	06014889	07000459
05000052	06015014	07001363	05000352	06014880	07000767	05000633	06014856	07000591	05000921	06014889	07000459
05000056	06014996	07001300	05000357	06014878	07000764	05000639	06014856	07000587	05000927	06014889	07000458
05000060	06014996	07001266	05000361	06014879	07000760	05000645	06014856	07000585			
05000065	06014995	07001260	05000365	06014879	07000759	05000649	06014856	07000583			
05000070	06014994	07001250	05000369	06014878	07000756	05000654	06014856	07000582			
05000075	06014977	07001227	05000374	06014878	07000754	05000659	06014856	07000580			
05000080	06014968	07001176	05000379	06014877	07000749	05000662	06014856	07000578			
05000085	06014960	07001147	05000384	06014877	07000746	05000667	06014857	07000577			
05000089	06014955	07001126	05000389	06014877	07000743	05000672	06014855	07000573			
05000093	06014950	07001106	05000395	06014876	07000740	05000676	06014854	07000568			
05000098	06014947	07001090	05000399	06014874	07000737	05000681	06014854	07000566			
05000103	06014941	07001074	05000404	06014873	07000727	05000688	06014853	07000563			
05000107	06014928	07001055	05000409	06014871	07000725	05000693	06014853	07000559			
05000112	06014925	07001012	05000413	06014869	07000716	05000698	06014852	07000555			
05000117	06014923	07001001				05000702	06014852	07000553			
05000122	06014923	07001001				05000708	06014852	07000550			
05000127	06014922	07000993	05000417	06014869	07000712	05000712	06014851	07000547			
05000132	06014920	07000988	05000423	06014869	07000710	05000716	06014851	07000543			
05000137	06014917	07000977	05000428	06014870	07000708	05000720	06014851	07000540			
05000142	06014916	07000970	05000433	06014869	07000707	05000725	06014849	07000538			
05000146	06014910	07000958	05000438	06014867	07000697	05000730	06014850	07000536			
05000150	06014910	07000939	05000442	06014867	07000695	05000734	06014850	07000534			
05000155	06014909	07000935	05000447	06014866	07000693	05000739	06014848	07000531			
05000159	06014909	07000931	05000451	06014866	07000688	05000743	06014848	07000529			
05000164	06014907	07000926	05000455	06014865	07000685	05000749	06014848	07000522			
05000169	06014905	07000915	05000461	06014865	07000682	05000753	06014847	07000519			
05000175	06014902	07000906	05000466	06014864	07000678	05000758	06014845	07000515			
05000180	06014903	07000902	05000472	06014863	07000674	05000764	06014846	07000512			
05000185	06014902	07000900	05000477	06014864	07000673	05000769	06014846	07000510			
05000190	06014901	07000892	05000482	06014864	07000671	05000773	06014845	07000507			
05000194	06014899	07000889	05000486	06014864	07000670	05000778	06014846	07000505			
05000203	06014896	07000882	05000491	06014865	07000668	05000783	06014845	07000504			
05000208	06014895	07000876	05000495	06014865	07000668	05000787	06014844	07000501			
05000213	06014892	07000869	05000500	06014865	07000667	05000792	06014844	07000498			
05000217	06014893	07000864	05000505	06014865	07000666	05000798	06014844	07000494			
05000224	06014893	07000864	05000508	06014865	07000663	05000804	06014843	07000492			
05000228	06014894	07000863	05000513	06014865	07000661	05000810	06014843	07000488			
05000231	06014893	07000859	05000519	06014864	07000658	05000814	06014843	07000486			
05000235	06014892	07000855	05000524	06014862	07000653	05000818	06014843	07000484			
05000241	06014890	07000846	05000529	06014862	07000647	05000824	06014843	07000483			
05000246	06014889	07000842	05000534	06014862	07000645	05000827	06014844	07000483			
05000251	06014887	07000835	05000539	06014861	07000642	05000831	06014844	07000481			
05000256	06014889	07000832	05000545	06014861	07000639	05000836	06014844	07000480			
05000265	06014896	07000845	05000549	06014861	07000637	05000841	06014844	07000477			
05000273	06014891	07000836	05000553	06014861	07000635	05000847	06014845	07000476			
05000278	06014889	07000827	05000557	06014861	07000634	05000852	06014844	07000475			
05000283	06014886	07000817	05000561	06014861	07000631	05000857	06014844	07000472			
05000289	06014887	07000811									

STATION

6A

DATE

12 NOV, 1966

TIME

07:41Z

LOCATION

32° 56.2'N × 118° 26.9'W

CRUISE

056610

## RAMSAY PROBE DATA

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
05000000	06015155	07001805		05000376	06014876	07000749	
05000001	06015155	07001800		05000382	06014877	07000745	
05000004	06015154	07001797		05000388	06014876	07000744	
05000007	06015155	07001797		05000395	06014876	07000740	
05000011	06015156	07001796		05000401	06014876	07000737	
05000016	06015157	07001796		05000409	06014873	07000732	
05000020	06015157	07001795		05000417	06014871	07000723	
05000027	06015158	07001796		05000423	06014869	07000711	
05000034	06015158	07001795		05000430	06014869	07000707	
05000041	06015123	07001779		05000437	06014870	07000706	
05000046	06015060	07001566		05000442	06014868	07000701	
05000053	06015025	07001424		05000449	06014868	07000696	
05000059	06015014	07001344		05000455	06014868	07000694	
05000066	06015001	07001309		05000462	06014869	07000692	
05000073	06014990	07001253		05000470	06014868	07000687	
05000079	06014982	07001215		05000477	06014867	07000683	
05000086	06014959	07001186		05000485	06014867	07000678	
05000092	06014952	07001118		05000491	06014866	07000675	
05000099	06014946	07001099		05000498	06014865	07000670	
05000105	06014939	07001069		05000504	06014866	07000666	
05000111	06014935	07001051		05000511	06014865	07000664	
05000117	06014931	07001034		05000517	06014864	07000660	
05000124	06014927	07001016		05000523	06014865	07000656	
05000131	06014922	07001002		05000530	06014863	07000653	
05000138	06014917	07000980		05000537	06014863	07000647	
05000145	06014914	07000967		05000544	06014860	07000641	
05000152	06014912	07000955		05000551	06014860	07000634	
05000159	06014911	07000948		05000558	06014860	07000631	
05000164	06014909	07000936		05000566	06014859	07000627	
05000171	06014910	07000937		05000572	06014858	07000623	
05000178	06014909	07000930		05000578	06014857	07000619	
05000185	06014906	07000919		05000583	06014857	07000613	
05000193	06014901	07000905		05000590	06014857	07000611	
05000199	06014895	07000890		05000596	06014856	07000606	
05000205	06014894	07000873		05000603	06014855	07000602	
05000212	06014894	07000874		05000610	06014856	07000597	
05000218	06014893	07000867		05000617	06014856	07000597	
05000224	06014893	07000863		05000624	06014855	07000594	
05000231	06014891	07000857		05000632	06014856	07000591	
05000237	06014890	07000850		05000639	06014855	07000587	
05000244	06014890	07000845		05000646	06014855	07000585	
05000250	06014890	07000840		05000651	06014856	07000580	
05000256	06014892	07000842		05000658	06014855	07000579	
05000262	06014890	07000840		05000664	06014855	07000577	
05000268	06014890	07000833		05000670	06014854	07000572	
05000275	06014891	07000832		05000677	06014853	07000568	
05000280	06014888	07000828		05000684	06014854	07000565	
05000287	06014888	07000818		05000690	06014855	07000564	
05000294	06014887	07000816		05000696	06014855	07000562	
05000302	06014884	07000806		05000700	06014855	07000560	
05000308	06014883	07000802					
05000315	06014881	07000792					
05000321	06014881	07000788					
05000327	06014882	07000783					
05000334	06014880	07000779					
05000342	06014881	07000775					
05000348	06014879	07000771					
05000356	06014878	07000764					
05000364	06014876	07000759					
05000370	06014876	07000752					

STATION  
7ADATE  
12 NOV, 1966TIME  
08:37ZLOCATION  
32°53.9'N × 118°24.3'WCRUISE  
056610



# RAMSAY PROBE DATA

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
0500000	06015162	07001824		0500346	06014883	07000781		0500704	06014851	07000550		05001070	06014869	07000449	
05000001	06015162	07001824		0500352	06014881	07000775		0500710	06014851	07000546		05001076	06014870	07000448	
05000006	06015162	07001816		0500358	06014880	07000769		0500717	06014851	07000543		05001082	06014871	07000449	
05000011	06015163	07001816		0500363	06014878	07000764		0500724	06014850	07000541		05001089	06014872	07000449	
05000017	06015164	07001815		0500370	06014877	07000755		0500730	06014850	07000537		05001097	06014873	07000449	
05000022	06015165	07001816		0500376	06014876	07000750		0500737	06014850	07000536		05001102	06014874	07000448	
05000028	06015166	07001816		0500383	06014877	07000748		0500744	06014849	07000529		05001108	06014875	07000449	
05000034	06015143	07001814		0500390	06014875	07000743		0500749	06014849	07000527		05001117	06014876	07000448	
05000039	06015073	07001615		0500395	06014873	07000736		0500756	06014848	07000522					
05000045	06015043	07001475		0500400	06014873	07000731		0500762	06014847	07000518					
05000051	06015018	07001387		0500406	06014872	07000728		0500768	06014847	07000514					
05000057	06015012	07001325		0500411	06014872	07000725		0500774	06014846	07000512					
05000062	06015010	07001310		0500419	06014871	07000716		0500780	06014846	07000508					
05000067	06015004	07001301		0500425	06014869	07000712		0500786	06014846	07000506					
05000073	06014995	07001264		0500432	06014867	07000707		0500791	06014847	07000504					
05000079	06014988	07001233		0500439	06014866	07000699		0500797	06014847	07000502					
05000086	06014982	07001213		0500444	06014866	07000694		0500803	06014847	07000501					
05000092	06014965	07001180		0500450	06014866	07000693		0500809	06014848	07000500					
05000099	06014958	07001130		0500456	06014867	07000692		0500817	06014847	07000496					
05000105	06014948	07001111		0500462	06014867	07000689		0500823	06014847	07000494					
05000112	06014943	07001073		0500467	06014866	07000686		0500829	06014847	07000491					
05000117	06014941	07001063		0500473	06014866	07000681		0500836	06014846	07000488					
05000123	06014937	07001048		0500479	06014865	07000677		0500842	06014846	07000485					
05000129	06014929	07001025		0500485	06014865	07000673		0500849	06014848	07000483					
05000135	06014925	07001008		0500491	06014864	07000670		0500855	06014848	07000483					
05000142	06014920	07000989		0500497	06014864	07000665		0500860	06014848	07000480					
05000149	06014918	07000973		0500504	06014864	07000663		0500866	06014847	07000477					
05000156	06014916	07000963		0500510	06014862	07000658		0500871	06014847	07000475					
05000162	06014913	07000954		0500517	06014862	07000653		0500877	06014847	07000472					
05000167	06014913	07000943		0500524	06014861	07000650		0500884	06014847	07000469					
05000173	06014913	07000942		0500530	06014860	07000643		0500890	06014848	07000468					
05000179	06014914	07000941		0500535	06014860	07000642		0500897	06014849	07000468					
05000185	06014913	07000938		0500541	06014860	07000638		0500903	06014848	07000465					
05000192	06014909	07000928		0500547	06014859	07000634		0500910	06014848	07000465					
05000199	06014909	07000917		0500552	06014859	07000632		0500917	06014849	07000461					
05000205	06014910	07000921		0500558	06014858	07000627		0500923	06014850	07000461					
05000211	06014907	07000906		0500564	06014858	07000625		0500930	06014850	07000455					
05000218	06014907	07000903		0500570	06014857	07000620		0500935	06014851	07000456					
05000223	06014906	07000899		0500577	06014857	07000616		0500942	06014852	07000455					
05000229	06014905	07000894		0500584	06014856	07000612		0500948	06014853	07000452					
05000234	06014901	07000884		0500591	06014857	07000611		0500953	06014853	07000457					
05000240	06014902	07000878		0500597	06014855	07000604		0500958	06014854	07000457					
05000247	06014901	07000875		0500602	06014853	07000599		0500964	06014854	07000456					
05000253	06014899	07000867		0500609	06014853	07000592		0500971	06014855	07000455					
05000260	06014899	07000856		0500615	06014852	07000589		0500977	06014856	07000455					
05000267	06014898	07000854		0500621	06014852	07000586		0500983	06014857	07000453					
05000273	06014899	07000852		0500626	06014852	07000584		0500991	06014858	07000453					
05000279	06014896	07000850		0500631	06014852	07000581		0500997	06014858	07000453					
05000285	06014890	07000835		0500638	06014853	07000580		0501004	06014860	07000452					
05000290	06014889	07000821		0500643	06014853	07000578		0501010	06014860	07000451					
05000295	06014892	07000819		0500650	06014852	07000575		0501016	06014861	07000451					
05000302	06014892	07000824		0500656	06014852	07000573		0501022	06014861	07000452					
05000309	06014891	07000821		0500662	06014851	07000566		0501028	06014862	07000451					
05000315	06014889	07000810		0500669	06014851	07000564		0501034	06014864	07000450					
05000322	06014887	07000805		0500676	06014852	07000562		0501040	06014864	07000450					
05000328	06014886	07000798		0500682	06014852	07000560		0501045	06014865	07000450					
05000334	06014884	07000794		0500687	06014852	07000558		0501050	06014866	07000450					
05000340	06014883	07000784		0500694	06014852	07000556		0501056	06014867	07000450					
				0500698	06014851	07000553		0501063	06014868	07000449					

STATION  
7B

DATE  
12 NOV, 1966

TIME  
09:19Z

LOCATION  
32°55.2'N × 118°22.6'W

CRUISE  
056610

## RAMSAY PROBE DATA

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
05000001	06015163	07001822		05000425	06014870	07000711		05000861	06014851	07000491	
05000006	06015163	07001821		05000433	06014870	07000709		05000868	06014850	07000486	
05000011	06015164	07001821		05000439	06014868	07000703					
05000019	06015166	07001821		05000446	06014867	07000696					
05000026	06015165	07001821		05000453	06014867	07000694					
05000032	06015128	07001789		05000460	06014868	07000689					
05000038	06015046	07001531		05000469	06014868	07000687					
05000045	06015018	07001399		05000476	06014867	07000684					
05000052	06015004	07001323		05000484	06014868	07000680					
05000060	06014997	07001283		05000491	06014867	07000679					
05000067	06014995	07001263		05000497	06014867	07000674					
05000073	06014982	07001223		05000504	06014867	07000671					
05000081	06014967	07001196		05000511	06014868	07000665					
05000088	06014957	07001146		05000519	06014865	07000662					
05000094	06014955	07001116		05000526	06014864	07000655					
05000101	06014947	07001101		05000533	06014861	07000648					
05000108	06014943	07001074		05000539	06014860	07000639					
05000114	06014937	07001059		05000547	06014860	07000636					
05000122	06014931	07001036		05000553	06014860	07000631					
05000128	06014926	07001014		05000561	06014860	07000630					
05000136	06014922	07000998		05000568	06014858	07000625					
05000144	06014918	07000979		05000576	06014858	07000619					
05000152	06014915	07000966		05000583	06014858	07000615					
05000159	06014910	07000951		05000591	06014858	07000613					
05000167	06014907	07000935		05000598	06014857	07000608					
05000175	06014906	07000926		05000606	06014857	07000604					
05000181	06014903	07000914		05000613	06014857	07000601					
05000189	06014905	07000909		05000620	06014858	07000599					
05000196	06014903	07000909		05000627	06014857	07000595					
05000204	06014901	07000894		05000635	06014854	07000591					
05000211	06014901	07000890		05000643	06014853	07000580					
05000219	06014902	07000885		05000650	06014854	07000578					
05000227	06014902	07000884		05000658	06014853	07000576					
05000233	06014903	07000881		05000665	06014853	07000570					
05000240	06014903	07000880		05000673	06014853	07000568					
05000247	06014898	07000871		05000679	06014853	07000565					
05000255	06014898	07000862		05000687	06014852	07000559					
05000262	06014896	07000852		05000695	06014851	07000554					
05000271	06014895	07000847		05000702	06014851	07000550					
05000278	06014894	07000841		05000710	06014851	07000549					
05000286	06014893	07000836		05000717	06014850	07000543					
05000293	06014890	07000832		05000725	06014850	07000540					
05000300	06014890	07000818		05000733	06014850	07000539					
05000306	06014888	07000813		05000740	06014849	07000534					
05000314	06014889	07000807		05000747	06014847	07000526					
05000321	06014890	07000806		05000755	06014846	07000519					
05000328	06014888	07000805		05000762	06014846	07000515					
05000336	06014886	07000795		05000770	06014846	07000512					
05000344	06014883	07000786		05000777	06014847	07000510					
05000352	06014881	07000776		05000785	06014848	07000509					
05000360	06014879	07000767		05000793	06014848	07000507					
05000368	06014878	07000760		05000800	06014849	07000505					
05000374	06014878	07000754		05000807	06014849	07000504					
05000382	06014877	07000749		05000816	06014849	07000502					
05000388	06014873	07000743		05000822	06014850	07000501					
05000395	06014873	07000734		05000830	06014850	07000497					
05000402	06014874	07000730		05000838	06014851	07000495					
05000410	06014871	07000726		05000845	06014851	07000494					
05000418	06014870	07000716		05000853	06014852	07000493					

STATION

6B

DATE

12 NOV, 1966

TIME

10:18Z

LOCATION

32° 58.8'N × 118° 22.7'W

CRUISE

056610



## RAMSAY PROBE DATA

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
0500000	06015162	07001818		0500327	06014888	07000802		0500790	06014853	07000522	
0500001	06015161	07001818		0500335	06014887	07000796		0500796	06014852	07000518	
0500003	06015161	07001817		0500344	06014886	07000788		0500798	06014853	07000515	
0500004	06015162	07001817		0500352	06014885	07000782		0500799	06014852	07000516	
0500006	06015162	07001818		0500359	06014884	07000779		0500801	06014852	07000514	
0500009	06015163	07001818		0500367	06014882	07000771		0500806	06014850	07000509	
0500011	06015163	07001817		0500375	06014878	07000759		0500814	06014851	07000506	
0500015	06015163	07001818		0500384	06014877	07000748		0500819	06014850	07000502	
0500018	06015164	07001818		0500393	06014877	07000745		0500827	06014849	07000498	
0500022	06015165	07001818		0500401	06014874	07000737		0500835	06014848	07000491	
0500026	06015165	07001818		0500411	06014872	07000726		0500842	06014848	07000488	
0500029	06015166	07001818		0500420	06014872	07000720		0500850	06014848	07000486	
0500032	06015165	07001816		0500429	06014870	07000712		0500857	06014848	07000483	
0500035	06015155	07001805		0500438	06014868	07000706		0500866	06014847	07000478	
0500038	06015132	07001749		0500446	06014866	07000696		0500873	06014847	07000473	
0500042	06015109	07001674		0500455	06014866	07000690		0500882	06014848	07000471	
0500046	06015068	07001538		0500463	06014866	07000686		0500891	06014849	07000471	
0500049	06015059	07001481		0500472	06014864	07000679		0500898	06014850	07000470	
0500050	06015057	07001453		0500480	06014864	07000673		0500907	06014850	07000469	
0500051	06015058	07001454		0500489	06014864	07000668		0500916	06014852	07000467	
0500052	06015051	07001449		0500499	06014863	07000663		0500924	06014853	07000466	
0500055	06015037	07001412		0500508	06014862	07000658		0500933	06014854	07000466	
0500058	06015013	07001378		0500516	06014861	07000652		0500941	06014854	07000464	
0500066	06014994	07001286		0500524	06014860	07000648		0500950	06014853	07000463	
0500073	06014974	07001229		0500532	06014859	07000641		0500958	06014856	07000461	
0500081	06014956	07001157		0500541	06014858	07000634		0500967	06014856	07000460	
0500088	06014946	07001110		0500548	06014858	07000630		0500976	06014858	07000459	
0500096	06014943	07001079		0500550	06014857	07000627		0500982	06014859	07000458	
0500102	06014939	07001067		0500551	06014858	07000627		0500989	06014860	07000457	
0500110	06014933	07001050		0500554	06014858	07000626		0500997	06014859	07000455	
0500117	06014929	07001024		0500562	06014856	07000619		0501004	06014860	07000453	
0500124	06014926	07001012		0500569	06014855	07000617		0501013	06014861	07000453	
0500131	06014921	07000993		0500577	06014854	07000611		0501021	06014862	07000452	
0500139	06014918	07000980		0500583	06014853	07000605		0501028	06014864	07000452	
0500146	06014917	07000970		0500591	06014854	07000600		0501036	06014865	07000451	
0500155	06014917	07000965		0500598	06014853	07000597		0501042	06014865	07000451	
0500162	06014911	07000955		0500606	06014852	07000593		0501047	06014866	07000450	
0500171	06014909	07000935		0500613	06014851	07000587		0501048	06014866	07000450	
0500178	06014908	07000927		0500621	06014851	07000583		0501049	06014866	07000450	
0500186	06014906	07000920		0500629	06014851	07000578		0501052	06014866	07000451	
0500194	06014909	07000914		0500637	06014852	07000578		0501053	06014866	07000450	
0500202	06014910	07000921		0500645	06014851	07000574					
0500210	06014908	07000912		0500652	06014852	07000571					
0500218	06014907	07000905		0500660	06014852	07000568					
0500226	06014908	07000901		0500668	06014852	07000565					
0500234	06014905	07000893		0500676	06014851	07000561					
0500241	06014902	07000879		0500685	06014852	07000560					
0500250	06014900	07000869		0500693	06014852	07000557					
0500258	06014897	07000860		0500702	06014852	07000553					
0500265	06014894	07000852		0500711	06014851	07000550					
0500273	06014895	07000842		0500719	06014852	07000547					
0500282	06014894	07000837		0500727	06014852	07000544					
0500289	06014892	07000832		0500736	06014852	07000541					
0500296	06014891	07000822		0500745	06014853	07000538					
0500300	06014890	07000817		0500752	06014854	07000536					
0500301	06014890	07000817		0500760	06014853	07000532					
0500305	06014890	07000815		0500768	06014853	07000530					
0500312	06014889	07000810		0500775	06014853	07000527					
0500320	06014889	07000805		0500783	06014852	07000523					

STATION  
6CDATE  
12 NOV, 1966TIME  
11:11ZLOCATION  
33°01.6'N × 118°18.0'WCRUISE  
056610



## RAMSAY PROBE DATA

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
05000001	06015155	07001801		05000293	06014892	07000828		05000601	06014896	07000603		05000965	06014895	07000455	
05000004	06015156	07001800		05000298	06014892	07000824		05000605	06014895	07000601		05000971	06014896	07000455	
05000007	06015156	07001798		05000304	06014892	07000821		05000612	06014893	07000593		05000976	06014897	07000454	
05000012	06015157	07001798		05000309	06014890	07000816		05000617	06014892	07000585		05000982	06014897	07000454	
05000016	06015158	07001798		05000314	06014889	07000809		05000624	06014892	07000583		05000988	06014898	07000454	
05000020	06015158	07001797		05000321	06014888	07000803		05000631	06014890	07000577		05000998	06014898	07000454	
05000023	06015158	07001794		05000326	06014886	07000797		05000637	06014890	07000573		05001000	06.14860	07000453	
05000028	06015154	07001788		05000331	06014886	07000795		05000643	06014889	07000568		05001007	06014861	07000453	
05000033	06015144	07001769		05000335	06014885	07000788		05000648	06014889	07000565		05001013	06014861	07000453	
05000037	06015098	07001687		05000339	06014885	07000787		05000654	06014890	07000564		05001020	06014863	07000453	
05000041	06015059	07001512		05000345	06014883	07000781		05000660	06014890	07000563		05001027	06014863	07000452	
05000045	06015049	07001455		05000350	06014882	07000774		05000667	06014889	07000560					
05000049	06015040	07001423		05000355	06014882	07000772		05000673	06014888	07000553					
05000054	06015026	07001390		05000360	06014880	07000765		05000680	06014889	07000552					
05000057	06015011	07001341		05000366	06014879	07000761		05000686	06014889	07000551					
05000063	06015003	07001298		05000372	06014879	07000756		05000693	06014890	07000549					
05000068	06014990	07001260		05000378	06014877	07000751		05000698	06014888	07000546					
05000071	06014987	07001232		05000384	06014875	07000744		05000704	06014888	07000541					
05000076	06014987	07001227		05000389	06014874	07000739		05000710	06014889	07000539					
05000086	06014968	07001180		05000393	06014874	07000735		05000715	06014888	07000536					
05000092	06014965	07001150		05000398	06014874	07000733		05000720	06014889	07000535					
05000096	06014960	07001140		05000402	06014873	07000728		05000727	06014889	07000533					
05000101	06014948	07001105		05000408	06014872	07000724		05000733	06014889	07000532					
05000105	06014944	07001082		05000413	06014872	07000718		05000739	06014887	07000527					
05000111	06014942	07001062		05000419	06014873	07000718		05000747	06014887	07000522					
05000117	06014939	07001060		05000425	06014872	07000716		05000753	06014887	07000518					
05000122	06014935	07001041		05000431	06014870	07000711		05000759	06014886	07000515					
05000127	06014934	07001030		05000435	06014869	07000704		05000766	06014886	07000511					
05000132	06014932	07001022		05000441	06014869	07000703		05000772	06014885	07000508					
05000137	06014930	07001016		05000445	06014869	07000700		05000778	06014885	07000504					
05000142	06014927	07001003		05000450	06014868	07000698		05000783	06014885	07000503					
05000147	06014925	07000992		05000455	06014868	07000693		05000790	06014885	07000500					
05000152	06014923	07000986		05000460	06014867	07000689		05000794	06014885	07000497					
05000159	06014922	07000977		05000465	06014866	07000685		05000801	06014885	07000496					
05000163	06014925	07000976		05000471	06014866	07000680		05000807	06014884	07000493					
05000168	06014923	07000977		05000477	06014864	07000676		05000814	06014884	07000490					
05000173	06014919	07000966		05000483	06014864	07000671		05000821	06014884	07000485					
05000178	06014915	07000947		05000488	06014864	07000668		05000828	06014885	07000483					
05000184	06014915	07000944		05000493	06014863	07000663		05000834	06014885	07000481					
05000189	06014916	07000941		05000497	06014861	07000661		05000840	06014884	07000479					
05000196	06014913	07000932		05000501	06014862	07000657		05000846	06014885	07000476					
05000201	06014913	07000926		05000507	06014862	07000654		05000853	06014885	07000475					
05000206	06014911	07000925		05000512	06014862	07000652		05000859	06014885	07000473					
05000210	06014909	07000914		05000517	06014862	07000652		05000864	06014885	07000472					
05000215	06014908	07000908		05000523	06014861	07000648		05000869	06014885	07000470					
05000220	06014909	07000905		05000529	06014861	07000644		05000875	06014886	07000469					
05000226	06014909	07000903		05000534	06014861	07000641		05000881	06014887	07000467					
05000232	06014907	07000899		05000540	06014861	07000639		05000888	06014888	07000467					
05000237	06014904	07000888		05000544	06014861	07000638		05000895	06014888	07000464					
05000242	06014902	07000878		05000548	06014861	07000636		05000902	06014889	07000464					
05000247	06014901	07000872		05000554	06014860	07000633		05000908	06014890	07000462					
05000251	06014901	07000868		05000559	06014860	07000630		05000914	06014890	07000462					
05000257	06014899	07000862		05000564	06014859	07000626		05000921	06014890	07000462					
05000262	06014899	07000859		05000570	06014860	07000623		05000927	06014891	07000459					
05000268	06014898	07000854		05000576	06014859	07000622		05000935	06014892	07000458					
05000274	06014898	07000853		05000581	06014860	07000618		05000941	06014893	07000458					
05000279	06014897	07000847		05000587	06014859	07000616		05000947	06014894	07000458					
05000283	06014895	07000838		05000592	06014858	07000613		05000953	06014894	07000458					
05000288	06014894	07000835		05000597	06014857	07000608		05000960	06014894	07000456					

STATION

7D

DATE

12 NOV, 1966

TIME

12:29Z

LOCATION

32°58.0'N × 118°18.0'W

CRUISE

056610

## RAMSAY PROBE DATA

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
05000000	06015156	07001800	
05000006	06015158	07001800	
05000013	06015158	07001800	
05000019	06015158	07001799	
05000024	06015151	07001790	
05000031	06015134	07001749	
05000036	06015110	07001686	
05000041	06015076	07001577	
05000046	06015050	07001498	
05000053	06015038	07001421	
05000060	06015023	07001379	
05000065	06015002	07001315	
05000071	06014996	07001266	
05000077	06014975	07001228	
05000082	06014959	07001154	
05000088	06014955	07001125	
05000094	06014945	07001110	
05000100	06014941	07001070	
05000101	06014940	07001059	
05000102	06014939	07001058	
05000104	06014939	07001056	
05000111	06014940	07001053	
05000117	06014937	07001047	
05000124	06014933	07001033	
05000131	06014931	07001021	
05000138	06014928	07001008	
05000144	06014926	07000994	
05000151	06014925	07000990	
05000157	06014925	07000982	
05000163	06014922	07000975	
05000170	06014921	07000970	
05000177	06014916	07000954	
05000183	06014913	07000940	
05000190	06014911	07000933	
05000197	06014911	07000924	
05000204	06014909	07000921	
05000210	06014908	07000911	
05000217	06014908	07000906	
05000223	06014907	07000901	
05000229	06014905	07000895	
05000236	06014903	07000882	
05000243	06014902	07000879	
05000249	06014899	07000870	

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
05000255	06014897	07000861	
05000262	06014895	07000850	
05000268	06014894	07000843	
05000275	06014893	07000836	
05000282	06014892	07000833	
05000288	06014891	07000827	
05000295	06014890	07000820	
05000301	06014890	07000816	
05000307	06014890	07000814	
05000314	06014890	07000811	
05000321	06014891	07000808	
05000327	06014889	07000808	
05000334	06014889	07000799	
05000340	06014886	07000788	
05000346	06014884	07000782	
05000349	06014883	07000776	
05000350	06014883	07000776	
05000352	06014881	07000772	
05000356	06014879	07000766	
05000363	06014877	07000757	
05000371	06014878	07000753	
05000376	06014876	07000750	
05000383	06014876	07000744	
05000391	06014875	07000741	
05000396	06014874	07000735	
05000403	06014873	07000730	
05000408	06014873	07000726	
05000415	06014872	07000722	
05000421	06014874	07000721	
05000427	06014874	07000719	
05000432	06014873	07000716	
05000439	06014870	07000701	
05000445	06014869	07000702	
05000452	06014868	07000696	
05000459	06014868	07000692	
05000464	06014867	07000688	
05000470	06014867	07000683	
05000476	06014866	07000680	
05000482	06014867	07000677	
05000488	06014866	07000674	
05000495	06014866	07000672	
05000501	06014865	07000667	
05000508	06014865	07000664	

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
05000514	06014865	07000662	
05000521	06014866	07000658	
05000527	06014864	07000656	
05000534	06014865	07000652	
05000539	06014863	07000650	
05000545	06014863	07000644	
05000550	06014862	07000640	
05000557	06014861	07000634	
05000563	06014859	07000629	
05000570	06014859	07000624	
05000576	06014858	07000619	
05000583	06014857	07000613	
05000589	06014857	07000610	
05000595	06014857	07000607	
05000596	06014856	07000603	
05000597	06014856	07000603	
05000600	06014856	07000602	
05000601	06014855	07000601	
05000605	06014854	07000599	
05000611	06014854	07000594	
05000617	06014853	07000590	
05000624	06014854	07000588	
05000627	06014854	07000586	
05000633	06014853	07000583	
05000643	06014852	07000578	
05000652	06014848	07000566	
05000657	06014848	07000561	
05000665	06014848	07000557	
05000642	06014848	07000555	
05000672	06014847	07000553	
05000678	06014847	07000550	
05000695	06014847	07000547	
05000663	06014847	07000544	
05000674	06014848	07000543	
05000680	06014848	07000541	
05000694	06014848	07000535	
05000700	06014848	07000531	
05000706	06014848	07000531	
05000718	06014847	07000525	
05000723	06014848	07000524	
05000727	06014848	07000522	
05000733	06014849	07000521	

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
05000738	06014848	07000519	
05000754	06014847	07000511	
05000761	06014847	07000505	
05000767	06014847	07000504	
05000771	06014846	07000501	
05000778	06014846	07000499	
05000781	06014847	07000497	
05000786	06014846	07000495	
05000793	06014846	07000494	
05000797	06014847	07000491	
05000804	06014846	07000488	
05000810	06014846	07000485	
05000813	06014846	07000482	
05000815	06014846	07000482	
05000817	06014846	07000482	
05000824	06014846	07000481	
05000831	06014847	07000478	
05000836	06014846	07000476	
05000842	06014846	07000473	
05000850	06014846	07000470	
05000858	06014847	07000468	
05000863	06014847	07000468	
05000869	06014847	07000465	
05000878	06014848	07000464	
05000884	06014848	07000462	
05000892	06014849	07000461	
05000896	06014849	07000460	
05000902	06014849	07000458	
05000910	06014850	07000457	
05000918	06014851	07000456	
05000925	06014852	07000455	
05000929	06014852	07000454	
05000937	06014854	07000453	
05000943	06014854	07000453	
05000951	06014855	07000452	
05000958	06014856	07000451	
05000964	06014857	07000451	
05000970	06014858	07000450	
05000975	06014858	07000451	
05000984	06014859	07000450	
05000991	06014860	07000450	
05000996	06014861	07000449	
05001005	06014862	07000449	
05001009	06014863	07000449	
05001015	06014864	07000449	

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
05001022	06014865	07000449	
05001030	06014866	07000448	
05001037	06014867	07000449	
05001042	06014869	07000449	
05001047	06014869	07000448	
05001053	06014870	07000448	
05001057	06014871	07000448	
05001058	06014870	07000448	
05001060	06014870	07000448	

STATION  
7EDATE  
12 NOV, 1966TIME  
13:29ZLOCATION  
32°59.2'N × 118°16.6'WCRUISE  
056610



## RAMSAY PROBE DATA

DEPTH (M)	SD. VEL. (M/S)	TEMP. C°	DEPTH (M)	SD. VEL. (M/S)	TEMP. C°	DEPTH (M)	SD. VEL. (M/S)	TEMP. C°
05000000	06015152	07001788	05000408	06014870	07000721	05000800	06014847	07000500
05000001	06015152	07001794	05000415	06014869	07000713	05000806	06014847	07000498
05000008	06015152	07001782	05000422	06014869	07000708			
05000015	06015153	07001781	05000430	06014869	07000705			
05000020	06015146	07001779	05000437	06014869	07000703			
05000027	06015108	07001701	05000442	06014868	07000699			
05000046	06015039	07001450	05000450	06014867	07000693			
05000051	06015024	07001374	05000455	06014867	07000690			
05000057	06014999	07001319	05000461	06014868	07000690			
05000063	06014990	07001254	05000469	06014867	07000685			
05000071	06014973	07001230	05000476	06014867	07000680			
05000077	06014963	07001164	05000483	06014865	07000677			
05000084	06014961	07001143	05000490	06014866	07000673			
05000091	06014957	07001134	05000496	06014865	07000670			
05000098	06014949	07001105	05000503	06014864	07000663			
05000105	06014946	07001088	05000509	06014864	07000660			
05000110	06014940	07001063	05000516	06014863	07000655			
05000118	06014937	07001056	05000523	06014864	07000651			
05000125	06014932	07001026	05000530	06014863	07000649			
05000132	06014932	07001020	05000538	06014862	07000645			
05000139	06014929	07001010	05000545	06014863	07000641			
05000145	06014926	07001005	05000552	06014862	07000637			
05000152	06014922	07000986	05000558	06014861	07000633			
05000159	06014920	07000972	05000565	06014860	07000628			
05000166	06014920	07000965	05000570	06014859	07000625			
05000173	06014918	07000961	05000577	06014860	07000621			
05000186	06014916	07000946	05000584	06014858	07000618			
05000193	06014911	07000932	05000590	06014858	07000612			
05000199	06014911	07000921	05000598	06014859	07000611			
05000206	06014909	07000917	05000605	06014860	07000611			
05000214	06014907	07000909	05000612	06014858	07000605			
05000220	06014907	07000901	05000619	06014859	07000601			
05000227	06014905	07000893	05000625	06014858	07000599			
05000233	06014904	07000891	05000632	06014857	07000594			
05000240	06014903	07000882	05000638	06014856	07000589			
05000247	06014900	07000873	05000644	06014855	07000583			
05000254	06014900	07000866	05000651	06014854	07000580			
05000261	06014903	07000867	05000658	06014854	07000574			
05000267	06014902	07000865	05000665	06014853	07000571			
05000274	06014901	07000861	05000673	06014851	07000564			
05000286	06014896	07000842	05000678	06014850	07000557			
05000294	06014895	07000837	05000686	06014850	07000554			
05000301	06014893	07000828	05000691	06014849	07000552			
05000308	06014891	07000820	05000698	06014850	07000548			
05000313	06014889	07000813	05000704	06014850	07000546			
05000320	06014888	07000805	05000711	06014850	07000544			
05000327	06014887	07000800	05000718	06014849	07000537			
05000334	06014886	07000794	05000725	06014846	07000531			
05000340	06014883	07000785	05000733	06014846	07000525			
05000347	06014880	07000777	05000741	06014846	07000523			
05000353	06014880	07000766	05000747	06014847	07000522			
05000361	06014878	07000763	05000754	06014846	07000516			
05000368	06014875	07000753	05000760	06014847	07000515			
05000375	06014874	07000745	05000767	06014848	07000515			
05000381	06014874	07000739	05000773	06014846	07000511			
05000388	06014874	07000738	05000778	06014847	07000506			
05000395	06014872	07000731	05000786	06014846	07000505			
05000401	06014871	07000724	05000792	06014846	07000502			

STATION

8E

DATE

12 NOV, 1966

TIME

14:52Z

LOCATION

32°56.4'N × 118°14.0'W

CRUISE

056610



# RAMSAY PROBE DATA

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
05000002	06015148	07001772		05000535	06014863	07000649	
05000010	06015147	07001771		05000544	06014861	07000642	
05000018	06015139	07001743		05000552	06014861	07000635	
05000026	06015128	07001723		05000560	06014861	07000633	
05000036	06015069	07001624		05000570	06014858	07000626	
05000044	06015035	07001438		05000588	06014857	07000611	
05000053	06015015	07001374		05000597	06014856	07000606	
05000061	06014988	07001296		05000604	06014857	07000602	
05000071	06014968	07001199		05000613	06014855	07000598	
05000081	06014958	07001155		05000620	06014854	07000592	
05000091	06014948	07001113		05000629	06014853	07000585	
05000102	06014941	07001079		05000639	06014852	07000579	
05000111	06014936	07001057		05000647	06014852	07000575	
05000121	06014934	07001038		05000658	06014851	07000569	
05000131	06014931	07001023		05000666	06014850	07000563	
05000141	06014928	07001008		05000675	06014851	07000560	
05000151	06014927	07000998		05000683	06014851	07000558	
05000160	06014925	07000989		05000691	06014850	07000554	
05000170	06014919	07000968		05000699	06014849	07000547	
05000180	06014920	07000952		05000708	06014849	07000545	
05000188	06014916	07000956		05000717	06014848	07000539	
05000198	06014909	07000929		05000726	06014848	07000534	
05000206	06014908	07000914		05000735	06014847	07000528	
05000215	06014908	07000907		05000745	06014847	07000525	
05000222	06014907	07000901		05000753	06014849	07000523	
05000232	06014906	07000896		05000761	06014849	07000521	
05000242	06014906	07000888		05000770	06014847	07000516	
05000251	06014904	07000882		05000777	06014847	07000511	
05000260	06014903	07000874		05000787	06014847	07000509	
05000269	06014901	07000865		05000795	06014847	07000503	
05000277	06014899	07000855		05000806	06014848	07000500	
05000286	06014896	07000843		05000815	06014848	07000497	
05000294	06014893	07000834		05000823	06014850	07000496	
05000303	06014889	07000820		05000831	06014851	07000496	
05000313	06014889	07000809					
05000322	06014881	07000791					
05000332	06014878	07000775					
05000339	06014877	07000769					
05000348	06014876	07000763					
05000357	06014875	07000755					
05000365	06014872	07000746					
05000376	06014872	07000737					
05000384	06014872	07000731					
05000393	06014872	07000730					
05000402	06014872	07000726					
05000410	06014872	07000723					
05000419	06014869	07000716					
05000429	06014869	07000707					
05000437	06014869	07000704					
05000447	06014868	07000699					
05000456	06014867	07000693					
05000464	06014866	07000686					
05000472	06014865	07000682					
05000480	06014866	07000677					
05000489	06014866	07000675					
05000498	06014864	07000668					
05000509	06014864	07000664					
05000517	06014864	07000659					
05000526	06014863	07000656					

STATION  
8D

DATE  
12 NOV, 1966

TIME  
15:25Z

LOCATION  
32°55.4'N X 118°15.6'W

CRUISE  
056610

## RAMSAY PROBE DATA

DEPTH (M)	SD. VEL. (M/S)	TEMP. C°	DEPTH (M)	SD. VEL. (M/S)	TEMP. C°	DEPTH (M)	SD. VEL. (M/S)	TEMP. C°
0500001	06015151	07001784	05000403	06014873	07000726	05000805	06014844	07000490
05000003	06015151	07001782	05000411	06014873	07000723	05000811	06014844	07000487
05000007	06015151	07001782	05000417	06014873	07000719	05000818	06014843	07000484
05000012	06015151	07001780	05000431	06014874	07000716	05000825	06014844	07000482
05000019	06015150	07001776	05000437	06014874	07000713	05000832	06014844	07000480
05000026	06015147	07001764	05000443	06014872	07000710	05000839	06014844	07000476
05000032	06015142	07001748	05000451	06014870	07000702	05000846	06014844	07000475
05000038	06015103	07001692	05000458	06014870	07000697	05000853	06014846	07000474
05000047	06015053	07001530	05000465	06014870	07000693	05000859	06014846	07000474
05000053	06015031	07001411	05000472	06014868	07000687	05000866	06014846	07000473
05000061	06015009	07001354	05000478	06014868	07000683	05000873	06014847	07000470
05000066	06014989	07001264	05000485	06014868	07000679	05000880	06014847	07000469
05000074	06014972	07001214	05000491	06014868	07000676	05000886	06014848	07000468
05000088	06014962	07001148	05000498	06014867	07000672	05000893	06014849	07000467
05000094	06014954	07001127	05000505	06014867	07000669	05000900	06014849	07000466
05000102	06014951	07001105	05000511	06014867	07000664	05000907	06014850	07000465
05000109	06014947	07001082	05000518	06014867	07000663	05000914	06014850	07000463
05000116	06014941	07001068	05000525	06014864	07000655	05000920	06014850	07000462
05000123	06014932	07001038	05000533	06014864	07000649	05000927	06014852	07000460
05000131	06014925	07001012	05000538	06014862	07000643	05000933	06014853	07000459
05000138	06014923	07000993	05000544	06014861	07000638	05000940	06014853	07000459
05000144	06014923	07000985	05000552	06014861	07000633	05000947	06014854	07000459
05000152	06014924	07000985	05000558	06014861	07000630	05000954	06014854	07000457
05000160	06014923	07000976	05000565	06014860	07000625	05000961	06014855	07000456
05000167	06014918	07000962	05000572	06014859	07000622	05000967	06014856	07000455
05000173	06014918	07000952	05000578	06014859	07000618	05000973	06014857	07000455
05000180	06014921	07000956	05000585	06014858	07000613	05000980	06014858	07000455
05000188	06014913	07000948	05000591	06014858	07000609	05000987	06014859	07000455
05000203	06014909	07000915	05000598	06014856	07000605	05000993	06014860	07000454
05000209	06014910	07000915	05000604	06014856	07000600	05001000	06014860	07000454
05000217	06014909	07000907	05000611	06014856	07000597	05001007	06014861	07000453
05000223	06014908	07000904	05000617	06014856	07000595	05001013	06014862	07000453
05000231	06014909	07000900	05000624	06014855	07000591	05001020	06014862	07000452
05000237	06014909	07000897	05000631	06014855	07000586	05001028	06014864	07000451
05000245	06014908	07000893	05000638	06014855	07000583			
05000252	06014907	07000885	05000645	06014854	07000579			
05000258	06014905	07000880	05000650	06014854	07000574			
05000266	06014902	07000869	05000657	06014854	07000572			
05000272	06014900	07000857	05000664	06014853	07000569			
05000280	06014899	07000850	05000671	06014852	07000566			
05000287	06014895	07000842	05000678	06014851	07000558			
05000294	06014892	07000829	05000683	06014852	07000557			
05000300	06014890	07000821	05000691	06014851	07000555			
05000307	06014888	07000808	05000697	06014852	07000551			
05000314	06014888	07000804	05000703	06014851	07000549			
05000322	06014886	07000798	05000711	06014851	07000544			
05000329	06014885	07000792	05000718	06014850	07000541			
05000335	06014883	07000785	05000725	06014850	07000538			
05000341	06014881	07000777	05000731	06014850	07000535			
05000348	06014880	07000770	05000737	06014850	07000531			
05000355	06014881	07000767	05000744	06014849	07000528			
05000362	06014880	07000764	05000751	06014848	07000524			
05000369	06014879	07000757	05000757	06014847	07000519			
05000376	06014877	07000750	05000764	06014846	07000513			
05000383	06014875	07000742	05000771	06014846	07000510			
05000390	06014874	07000737	05000778	06014845	07000505			
05000396	06014873	07000730	05000786	06014845	07000500			
			05000792	06014845	07000499			
			05000798	06014844	07000494			

STATION

8C

DATE

13 NOV, 1966

TIME

02:58Z

LOCATION

32°54.4'N × 118°17.3'W

CRUISE

056610

## RAMSAY PROBE DATA

DEPTH (M)	SD. VEL. (M/S)	TEMP. C°	DEPTH (M)	SD. VEL. (M/S)	TEMP. C°	DEPTH (M)	SD. VEL. (M/S)	TEMP. C°
05000002	06015148	07001775	05000433	06014875	07000722	05000840	06014846	07000482
05000008	06015149	07001773	05000441	06014872	07000715	05000846	06014846	07000481
05000015	06015150	07001773	05000447	06014869	07000702	05000853	06014847	07000479
05000023	06015150	07001770	05000455	06014869	07000695	05000859	06014848	07000478
05000029	06015141	07001763	05000461	06014868	07000691	05000866	06014849	07000477
05000036	06015102	07001701	05000468	06014868	07000687	05000874	06014847	07000476
05000042	06015051	07001522	05000475	06014867	07000682	05000881	06014847	07000466
05000050	06015025	07001387	05000482	06014867	07000679	05000889	06014846	07000465
05000057	06015008	07001350	05000489	06014867	07000676	05000895	06014847	07000463
05000064	06014990	07001260	05000496	06014866	07000673	05000902	06014848	07000463
05000070	06014986	07001234	05000502	06014865	07000667	05000908	06014847	07000459
05000077	06014979	07001216	05000509	06014864	07000660	05000907	06014847	07000458
05000084	06014965	07001173	05000517	06014864	07000656			
05000091	06014952	07001134	05000523	06014864	07000653			
05000099	06014944	07001085	05000531	06014862	07000648			
05000107	06014942	07001072	05000536	06014863	07000645			
05000114	06014935	07001051	05000543	06014862	07000643			
05000122	06014927	07001020	05000551	06014862	07000637			
05000130	06014921	07000998	05000558	06014862	07000635			
05000138	06014916	07000977	05000565	06014861	07000630			
05000147	06014915	07000962	05000571	06014860	07000624			
05000155	06014918	07000961	05000577	06014858	07000620			
05000162	06014916	07000955	05000584	06014856	07000610			
05000170	06014913	07000946	05000592	06014855	07000603			
05000179	06014913	07000934	05000598	06014855	07000601			
05000187	06014913	07000933	05000606	06014856	07000598			
05000194	06014912	07000925	05000612	06014856	07000596			
05000202	06014911	07000921	05000619	06014856	07000594			
05000210	06014910	07000912	05000625	06014855	07000590			
05000217	06014909	07000907	05000632	06014854	07000585			
05000224	06014908	07000903	05000640	06014853	07000581			
05000232	06014907	07000898	05000647	06014854	07000579			
05000240	06014906	07000888	05000653	06014854	07000577			
05000247	06014905	07000880	05000660	06014854	07000573			
05000254	06014901	07000871	05000666	06014853	07000569			
05000261	06014899	07000861	05000673	06014852	07000565			
05000268	06014894	07000848	05000680	06014851	07000559			
05000274	06014893	07000833	05000688	06014851	07000557			
05000281	06014892	07000831	05000695	06014849	07000550			
05000288	06014892	07000829	05000702	06014848	07000544			
05000295	06014893	07000827	05000709	06014849	07000542			
05000301	06014891	07000818	05000715	06014849	07000540			
05000308	06014890	07000816	05000721	06014849	07000538			
05000315	06014890	07000810	05000728	06014848	07000532			
05000323	06014889	07000804	05000737	06014847	07000529			
05000330	06014887	07000798	05000743	06014846	07000524			
05000337	06014886	07000792	05000750	06014843	07000518			
05000343	06014886	07000789	05000756	06014844	07000510			
05000349	06014886	07000789	05000763	06014844	07000507			
05000358	06014886	07000780	05000771	06014844	07000504			
05000364	06014884	07000774	05000778	06014843	07000501			
05000372	06014882	07000765	05000785	06014843	07000499			
05000378	06014879	07000759	05000792	06014842	07000494			
05000384	06014878	07000750	05000799	06014842	07000490			
05000392	06014879	07000748	05000805	06014843	07000489			
05000399	06014880	07000745	05000811	06014843	07000487			
05000406	06014879	07000744	05000819	06014844	07000485			
05000413	06014877	07000736	05000826	06014844	07000484			
05000419	06014876	07000729	05000833	06014845	07000483			
05000426	06014876	07000723						

STATION

8B

DATE

13 NOV, 1966

TIME

03:42Z

LOCATION

32°52.2'N × 118°19.4'W

CRUISE

056610



## RAMSAY PROBE DATA

DEPTH (M)	SD. VEL. (M/S)	TEMP. C°	DEPTH (M)	SD. VEL. (M/S)	TEMP. C°
0500011	06015155	07001792	05000501	06014861	07000657
0500020	06015157	07001792	05000509	06014862	07000654
0500028	06015080	07001716	05000517	06014861	07000652
0500036	06015035	07001486	05000525	06014859	07000645
0500044	06015016	07001380	05000533	06014856	07000633
0500053	06014993	07001288	05000543	06014856	07000628
0500062	06014987	07001249	05000551	06014854	07000621
0500071	06014975	07001224	05000559	06014854	07000615
0500080	06014967	07001173	05000567	06014854	07000612
0500089	06014945	07001083	05000576	06014854	07000608
0500096	06014943	07001074	05000585	06014853	07000604
0500115	06014938	07001055	05000593	06014853	07000600
0500123	06014935	07001044	05000600	06014852	07000595
0500130	06014929	07001018	05000608	06014852	07000591
0500139	06014922	07000999	05000614	06014852	07000587
0500147	06014920	07000981			
0500154	06014917	07000967			
0500163	06014914	07000953			
0500171	06014911	07000942			
0500179	06014911	07000931			
0500187	06014909	07000926			
0500195	06014903	07000914			
0500203	06014898	07000892			
0500211	06014895	07000877			
0500218	06014895	07000871			
0500227	06014899	07000873			
0500234	06014899	07000874			
0500242	06014898	07000866			
0500250	06014899	07000866			
0500259	06014899	07000860			
0500267	06014898	07000854			
0500274	06014898	07000850			
0500282	06014898	07000845			
0500290	06014897	07000842			
0500297	06014894	07000832			
0500305	06014893	07000824			
0500314	06014883	07000809			
0500323	06014881	07000784			
0500332	06014880	07000783			
0500339	06014878	07000771			
0500347	06014877	07000765			
0500357	06014874	07000757			
0500365	06014874	07000747			
0500374	06014874	07000743			
0500382	06014874	07000740			
0500390	06014874	07000736			
0500399	06014874	07000732			
0500408	06014872	07000727			
0500416	06014869	07000713			
0500424	06014866	07000707			
0500432	06014866	07000697			
0500441	06014866	07000694			
0500450	06014867	07000693			
0500458	06014865	07000690			
0500467	06014865	07000681			
0500474	06014865	07000679			
0500483	06014863	07000672			
0500492	06014862	07000665			

STATION  
8ADATE  
13 NOV, 1966TIME  
04:29ZLOCATION  
32°51.4'N × 118°21.4'WCRUISE  
056610

# RAMSAY PROBE DATA

DEPTH SD. VEL. TEMP.

(M) (M/S) C°

05000002 06015149 07001778  
 05000005 06015149 07001776  
 05000010 06015150 07001775  
 05000013 06015151 07001775  
 05000016 06015151 07001776  
 05000019 06015150 07001775  
 05000023 06015145 07001765  
 05000027 06015130 07001738  
 05000031 06015104 07001647  
 05000035 06015082 07001581  
 05000038 06015076 07001533  
 05000042 06015071 07001510  
 05000045 06015054 07001489  
 05000049 06015031 07001396  
 05000053 06015030 07001368  
 05000061 06014995 07001262  
  
 05000064 06014992 07001250  
 05000069 06014984 07001229  
 05000072 06014981 07001206  
 05000076 06014978 07001195  
 05000080 06014978 07001186  
 05000083 06014977 07001185  
 05000087 06014974 07001177  
 05000091 06014964 07001161  
 05000095 06014952 07001118  
 05000099 06014950 07001092  
 05000103 06014950 07001090  
 05000106 06014949 07001085  
 05000110 06014949 07001082  
 05000113 06014949 07001079  
 05000117 06014947 07001075  
 05000122 06014946 07001065  
 05000126 06014944 07001062

STATION  
9A

DATE  
13 NOV, 1966

TIME  
05:22Z

LOCATION  
32° 46.8'N × 118° 22.4'W

CRUISE  
056610

## RAMSAY PROBE DATA

DEPTH (M)	SD.VEL. (M/S)	TEMP. C°	DEPTH (M)	SD.VEL. (M/S)	TEMP. C°
0500000	06015141	07001748	05000425	06014867	07000708
05000001	06015141	07001749	05000432	06014868	07000700
05000002	06015141	07001748	05000439	06014866	07000697
05000010	06015143	07001748	05000446	06014865	07000691
05000018	06015143	07001747	05000454	06014864	07000685
05000026	06015140	07001740	05000462	06014863	07000680
05000033	06015134	07001721	05000469	06014861	07000670
05000041	06015129	07001701	05000476	06014859	07000665
05000056	06015063	07001570	05000482	06014858	07000657
05000064	06015013	07001361	05000489	06014858	07000652
05000070	06014992	07001295	05000496	06014857	07000649
05000077	06014979	07001231	05000503	06014857	07000645
05000083	06014965	07001178	05000511	06014856	07000638
05000090	06014949	07001122	05000518	06014856	07000635
05000097	06014939	07001079	05000525	06014856	07000632
05000104	06014934	07001050	05000531	06014855	07000628
05000112	06014929	07001034	05000539	06014854	07000625
05000117	06014927	07001015	05000545	06014854	07000619
05000125	06014923	07001005	05000553	06014855	07000616
05000132	06014920	07000989	05000561	06014854	07000614
05000140	06014917	07000977	05000567	06014854	07000611
05000147	06014916	07000965	05000573	06014853	07000606
05000154	06014914	07000960	05000580	06014853	07000602
05000160	06014911	07000945	05000587	06014851	07000596
05000168	06014908	07000932	05000594	06014851	07000594
05000175	06014907	07000921	05000601	06014851	07000587
05000182	06014908	07000924	05000608	06014852	07000586
05000189	06014907	07000915	05000615	06014851	07000584
05000196	06014908	07000912	05000624	06014850	07000579
05000203	06014907	07000909	05000630	06014848	07000572
05000211	06014906	07000904	05000637	06014848	07000569
05000219	06014907	07000896	05000643	06014848	07000565
05000226	06014903	07000894	05000650	06014849	07000562
05000233	06014902	07000882	05000658	06014848	07000561
05000239	06014899	07000874	05000665	06014848	07000554
05000247	06014897	07000864	05000672	06014848	07000553
05000254	06014896	07000856	05000679	06014848	07000552
05000261	06014894	07000851	05000684	06014850	07000552
05000268	06014892	07000839	05000692	06014848	07000549
05000275	06014892	07000832	05000699	06014848	07000542
05000289	06014890	07000823	05000707	06014849	07000541
05000297	06014889	07000819	05000714	06014850	07000539
05000304	06014889	07000810	05000720	06014849	07000538
05000311	06014889	07000809	05000727	06014849	07000535
05000319	06014888	07000805	05000733	06014850	07000532
05000326	06014888	07000798	05000740	06014849	07000530
05000332	06014886	07000795	05000747	06014849	07000525
05000339	06014885	07000789	05000755	06014850	07000522
05000346	06014884	07000781	05000762	06014850	07000522
05000355	06014882	07000775	05000767	06014851	07000523
05000361	06014881	07000769	05000775	06014852	07000521
05000368	06014880	07000760	05000782	06014851	07000521
05000375	06014877	07000755	05000788	06014848	07000512
05000382	06014875	07000745	05000796	06014845	07000502
05000389	06014874	07000738	05000803	06014846	07000496
05000396	06014873	07000732	05000809	06014846	07000495
05000404	06014872	07000727	05000816	06014847	07000494
05000412	06014871	07000720			
05000418	06014870	07000714			

STATION

9C

DATE

13 NOV, 1966

TIME

06:16Z

LOCATION

32° 50.0'N × 118° 16.0'W

CRUISE

056610



## RAMSAY PROBE DATA

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
05000001	06015149	07001779		05000373	06014870	07000732		05000696	06014847	07000542	
05000005	06015148	07001774		05000379	06014869	07000731		05000702	06014844	07000534	
05000010	06015149	07001773		05000385	06014869	07000723		05000710	06014845	07000530	
05000015	06015149	07001772		05000392	06014868	07000720		05000717	06014845	07000528	
05000022	06015145	07001763		05000397	06014869	07000717		05000725	06014846	07000527	
05000027	06015143	07001748		05000398	06014868	07000716		05000731	06014847	07000526	
05000032	06015142	07001740		05000400	06014868	07000715		05000739	06014847	07000524	
05000039	06015142	07001734		05000406	06014866	07000711		05000745	06014847	07000523	
05000044	06015134	07001731		05000412	06014864	07000709		05000753	06014847	07000521	
05000050	06015116	07001670		05000417	06014865	07000699		05000761	06014847	07000517	
05000055	06015074	07001605		05000423	06014864	07000699		05000768	06014847	07000513	
05000063	06015028	07001434		05000429	06014864	07000693		05000775	06014848	07000511	
05000069	06014997	07001314		05000434	06014863	07000689		05000781	06014848	07000512	
05000074	06014982	07001239		05000438	06014863	07000686		05000788	06014849	07000510	
05000081	06014969	07001201		05000444	06014863	07000683		05000794	06014849	07000511	
05000088	06014956	07001144		05000451	06014862	07000679		05000795	06014849	07000511	
05000095	06014946	07001107		05000457	06014862	07000675		05000796	06014849	07000511	
05000101	06014942	07001077		05000462	06014862	07000673		05000798	06014850	07000511	
05000108	06014936	07001059		05000467	06014861	07000671					
05000115	06014931	07001033		05000472	06014860	07000666					
05000122	06014927	07001022		05000478	06014859	07000662					
05000129	06014924	07001001		05000484	06014859	07000657					
05000135	06014922	07000994		05000490	06014858	07000653					
05000142	06014919	07000983		05000492	06014858	07000649					
05000150	06014917	07000969		05000493	06014858	07000649					
05000156	06014915	07000961		05000497	06014858	07000648					
05000162	06014914	07000953		05000503	06014858	07000646					
05000169	06014914	07000948		05000509	06014859	07000645					
05000176	06014915	07000946		05000515	06014858	07000643					
05000183	06014915	07000942		05000522	06014858	07000639					
05000188	06014912	07000935		05000526	06014856	07000633					
05000195	06014913	07000928		05000533	06014855	07000628					
05000200	06014911	07000919		05000539	06014854	07000622					
05000201	06014911	07000919		05000546	06014854	07000618					
05000202	06014908	07000918		05000551	06014854	07000616					
05000206	06014907	07000909		05000558	06014853	07000613					
05000214	06014906	07000901		05000564	06014852	07000608					
05000222	06014906	07000896		05000570	06014851	07000605					
05000229	06014905	07000891		05000575	06014851	07000599					
05000236	06014905	07000888		05000581	06014850	07000596					
05000244	06014903	07000882		05000586	06014850	07000592					
05000250	06014902	07000873		05000588	06014851	07000591					
05000259	06014902	07000868		05000593	06014850	07000591					
05000266	06014901	07000865		05000590	06014850	07000591					
05000272	06014899	07000857		05000594	06014850	07000589					
05000279	06014897	07000852		05000601	06014851	07000588					
05000286	06014896	07000841		05000608	06014852	07000588					
05000293	06014892	07000831		05000613	06014852	07000587					
05000300	06014889	07000821		05000620	06014850	07000584					
05000306	06014886	07000808		05000627	06014850	07000577					
05000313	06014882	07000796		05000633	06014850	07000574					
05000319	06014882	07000789		05000640	06014851	07000573					
05000326	06014880	07000783		05000647	06014851	07000570					
05000332	06014878	07000774		05000654	06014850	07000568					
05000339	06014876	07000767		05000660	06014849	07000562					
05000346	06014876	07000759		05000667	06014848	07000555					
05000352	06014874	07000755		05000675	06014847	07000550					
05000358	06014872	07000748		05000681	06014847	07000547					
05000365	06014870	07000738		05000688	06014847	07000543					

STATION 9D DATE 13 NOV, 1966 TIME 07:05Z LOCATION 32°51.7'N × 118°16.0'W CRUISE 056610

## RAMSAY PROBE DATA

DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.	DEPTH (M)	SD. (M/S)	VEL. C°	TEMP.
0500002	06015158	07001808		05000354	06014880	07000772	
0500005	06015158	07001806		05000362	06014876	07000759	
0500010	06015158	07001805		05000369	06014876	07000753	
0500017	06015158	07001803		05000376	06014875	07000746	
				05000383	06014873	07000740	
0500024	06015156	07001798		05000391	06014872	07000732	
0500031	06015143	07001778		05000399	06014870	07000725	
0500038	06015096	07001695		05000407	06014869	07000719	
0500044	06015062	07001523		05000414	06014868	07000712	
0500052	06015039	07001457		05000421	06014868	07000708	
0500059	06015012	07001356		05000428	06014867	07000705	
0500066	06014997	07001311		05000437	06014866	07000696	
0500075	06014970	07001204		05000444	06014866	07000695	
0500082	06014960	07001154		05000452	06014866	07000689	
0500092	06014951	07001129		05000458	06014865	07000687	
0500099	06014947	07001099		05000466	06014865	07000680	
0500108	06014940	07001071		05000474	06014864	07000675	
0500116	06014937	07001054		05000481	06014863	07000671	
0500124	06014932	07001027		05000489	06014863	07000667	
0500133	06014929	07001018		05000497	06014862	07000662	
0500140	06014924	07000998		05000504	06014862	07000658	
0500150	06014925	07000985		05000512	06014860	07000651	
0500157	06014921	07000981		05000519	06014860	07000648	
0500165	06014913	07000954		05000527	06014857	07000640	
0500173	06014914	07000946		05000534	06014856	07000630	
0500181	06014915	07000946		05000542	06014857	07000628	
0500189	06014913	07000936		05000550	06014856	07000625	
0500197	06014912	07000928		05000558	06014857	07000622	
0500204	06014912	07000922		05000565	06014856	07000618	
0500212	06014911	07000917		05000572	06014856	07000613	
0500219	06014910	07000913		05000579	06014856	07000611	
0500228	06014909	07000906		05000587	06014855	07000606	
0500235	06014908	07000900		05000593	06014853	07000600	
0500242	06014907	07000895		05000601	06014852	07000594	
0500249	06014906	07000889		05000609	06014851	07000588	
0500255	06014906	07000882		05000617	06014852	07000585	
0500263	06014905	07000877		05000625	06014850	07000580	
0500271	06014904	07000872		05000633	06014848	07000571	
0500278	06014904	07000865		05000640	06014847	07000567	
0500286	06014902	07000860		05000647	06014848	07000563	
0500293	06014899	07000851		05000654	06014848	07000559	
0500300	06014899	07000844		05000662	06014847	07000556	
0500308	06014895	07000836		05000669	06014847	07000552	
0500317	06014894	07000823		05000676	06014847	07000551	
0500324	06014890	07000814		05000684	06014847	07000549	
0500330	06014887	07000802		05000691	06014847	07000543	
0500337	06014885	07000793		05000699	06014848	07000542	
0500346	06014882	07000781		05000707	06014848	07000540	
				05000715	06014849	07000539	
				05000724	06014849	07000535	
				05000732	06014849	07000531	
				05000737	06014849	07000530	
				05000738	06014849	07000529	

DOWN SAMPLING ONLY

STATION  
9EDATE  
13 NOV, 1966TIME  
08:18ZLOCATION  
32°53.1'N × 118°13.2'WCRUISE  
056610

CRUISE	STATION NUMBER		DATE (GMT)				LATITUDE	LONGITUDE	SONIC DEPTH METERS	WIND				
	ASSIGNED	CONSECUTIVE	MO	DAY	YR	HR	N	W		M/SEC	DIR			
056610	1A	1	11	3	66	16	33° 04.0	118° 39.5	229	2.1	275			
ANEMO HGT	BAROMETER MBS	TEMPERATURE		HUMIDITY %	WW	CLOUD		SEA		SWELL		VSBY	WATER	
		DRY	WET			TYPE	AMT	DIR	AMT	DIR	AMT		COLOR	TRANS
	1025	16.39	14.39	79		strat	10/10	---	calm	320	1'	5 m.		

OBSERVED DEPTH(m)	TEMP °C	SALINITY ‰	DENSITY σ <sub>t</sub>	SND VEL m/sec
0	18.48	33.49	23.64	1516.1
142	9.78	33.91	26.23	1490.6
208	8.68	34.12	26.40	1487.8

CRUISE	STATION NUMBER		DATE (GMT)				LATITUDE	LONGITUDE	SONIC DEPTH METERS	WIND				
	ASSIGNED	CONSECUTIVE	MO	DAY	YR	HR	N	W		M/SEC	DIR			
056610	2C	2	11	11	66	06	33 07.5	118 29.5	1207	3.6	300			
ANEMO HGT	BAROMETER MBS	TEMPERATURE		HUMIDITY %	WW	CLOUD		SEA		SWELL		VSBY	WATER	
		DRY	WET			TYPE	AMT	DIR	AMT	DIR	AMT		COLOR	TRANS
	1019	18.00	14.72	70		strat	1/10	--	calm	--	0	10m		

OBSERVED DEPTH(m)	TEMP °C	SALINITY ‰	DENSITY σ <sub>t</sub>	SND VEL m/sec
0	17.89	33.55	24.21	1514.5
247	8.37	34.15	26.57	1487.2
492	6.52	34.35	27.00	1484.5
740	5.16	34.38	27.18	1483.1
988	4.17	34.46	27.36	1483.1
1088	4.10	34.46	27.37	1484.5



CRUISE	STATION NUMBER		DATE (GMT)				LATITUDE	LONGITUDE	SONIC DEPTH METERS	WIND				
	ASSIGNED	CONSECUTIVE	MO	DAY	YR	HR	N	W		M/SEC	DIR			
056610	4C	3	11	11	66	11	33° 04.1	118° 27.1	1152	1.0	280			
ANEMO HGT	BAROMETER MBS	TEMPERATURE		HUMIDITY %	WW	CLOUD		SEA		SWELL		VSBY	WATER	
		DRY	WET			TYPE	AMT	DIR	AMT	DIR	AMT		COLOR	TRANS
	1020	16.11	13.33	73		Cum	3/10	--	calm	300	1.5'	10m.		

OBSERVED DEPTH(m)	TEMP °C	SALINITY ‰	DENSITY σ <sub>t</sub>	SND VEL m/sec
0	17.78	33.53	24.19	1514.0
250	8.12	34.09	26.56	1486.2
500	6.53	34.30	26.96	1484.5
750	5.02	34.42	27.24	1482.8
1000	4.18	34.46	27.36	1483.3
1100	4.10	34.46	27.37	1484.7

CRUISE	STATION NUMBER		DATE (GMT)				LATITUDE		LONGITUDE		SONIC DEPTH METERS	WIND		
	ASSIGNED	CONSECUTIVE	MO	DAY	YR	HR	N.		W			M/SEC	DIR	
056610	5E	4	11	12	66	04	33	01.5	118	23.1	732	3.1	290	
ANEMO HGT	BAROMETER MBS	TEMPERATURE		HUMIDITY %	WW	CLOUD		SEA		SWELL		VSBY	WATER	
		DRY	WET			TYPE	AMT	DIR	AMT	DIR	AMT		COLOR	TRANS
	1020	16.11	13.33	73		SCum	1/10	290	1'	--	0	10m.		

OBSERVED DEPTH(m)	TEMP °C	SALINITY ‰	DENSITY σ <sub>t</sub>	SND VEL m/sec
0	17.83	33.54	24.22	1514.5
99	10.66	33.64	25.79	1493.8
198	8.83	34.03	26.41	1488.1
297	8.06	34.18	26.64	1487.1
447	6.83	34.27	26.89	1484.8
596	5.69	34.35	27.10	1482.8

NANSEN CAST DATA

CRUISE	STATION NUMBER		DATE (GMT)				LATITUDE	LONGITUDE	SONIC DEPTH METERS	WIND	
	ASSIGNED	CONSECUTIVE	MO	DAY	YR	HR	N	W		M/SEC	DIR
056610	6C	5	11	12	66	11	33° 01.9	118° 18.0	1088	4.1	320

ANEMO HGT	BAROMETER MBS	TEMPERATURE		HUMIDITY %	WW	CLOUD		SEA		SWELL		VSBY	WATER	
		DRY	WET			TYPE	AMT	DIR	AMT	DIR	AMT		COLOR	TRANS
	1019	16.11	13.89	78		Cum	--	320	1'	--	0	10m.		

OBSERVED DEPTH(m)	TEMP °C	SALINITY ‰	DENSITY σ <sub>t</sub>	SND VEL m/sec
0	17.79	33.56	24.24	1514.2
249	8.47	34.14	26.54	1487.7
498	6.36	34.29	26.96	1483.8
747	5.04	34.39	27.22	1482.8
997	4.18	34.45	27.35	1483.3
1047	4.16	34.61	27.48	1484.3

CRUISE	STATION NUMBER		DATE (GMT)				LATITUDE	LONGITUDE	SONIC DEPTH METERS	WIND				
	ASSIGNED	CONSECUTIVE	MO	DAY	YR	HR	N	W		M/SEC	DIR			
056610	7E	6	11	12	66	14	32 59.2	118 16.6	1134	2.1	320			
ANEMO HGT	BAROMETER MBS	TEMPERATURE		HUMIDITY %	WW	CLOUD		SEA		SWELL		VSBY	WATER	
		DRY	WET			TYPE	AMT	DIR	AMT	DIR	AMT		COLOR	TRANS
	1019	16.11	13.33	73		Cum	9/10	320	1'	--	0	10m.		

OBSERVED DEPTH(m)	TEMP °C	SALINITY ‰	DENSITY σ <sub>t</sub>	SND VEL m/sec
0	17.60	33.52	24.14	1513.5
240	8.68	34.11	26.49	1488.3
480	6.58	34.28	26.93	1484.3
721	5.14	34.39	27.20	1482.7
961	4.19	34.46	27.35	1482.8
1057	4.16	34.46	27.35	1484.2



CRUISE	STATION NUMBER		DATE (GMT)				LATITUDE	LONGITUDE	SONIC DEPTH METERS	WIND				
	ASSIGNED	CONSECUTIVE	MO	DAY	YR	HR	N	W		M/SEC	DIR			
056610	9D	7	11	13	66	07	32° 51.7	118° 16.0	845	5.2	310			
ANEMO HGT	BAROMETER MBS	TEMPERATURE		HUMIDITY %	WW	CLOUD		SEA		SWELL		VSBY	WATER	
		DRY	WET			TYPE	AMT	DIR	AMT	DIR	AMT		COLOR	TRANS
	1017	16.11	15.00	89		SCum	2/10	320	2'	--	0	10m.		

OBSERVED DEPTH(m)	TEMP °C	SALINITY ‰	DENSITY σ <sub>t</sub>	SND VEL m/sec
0	17.37	33.46	24.29	1512.8
195	9.19	33.99	26.32	1489.3
289	8.20	34.18	26.64	1487.4
386	7.12	34.23	26.82	1484.8
583	5.70	34.33	27.08	1482.6
782	4.83	34.41	27.25	1582.4

CRUISE	STATION NUMBER		DATE (GMT)				LATITUDE		LONGITUDE		SONIC DEPTH METERS	WIND		
	ASSIGNED	CONSECUTIVE	MO	DAY	YR	HR	N	W	M/SEC	DIR				
056610	10A	8	12	8	66	19	32 32.5	118 12.2	1682	4.1	320			
ANEMO HGT	BAROMETER MBS	TEMPERATURE		HUMIDITY %	WW	CLOUD		SEA		SWELL		VSBY	WATER	
		DRY	WET			TYPE	AMT	DIR	AMT	DIR	AMT		COLOR	TRANS
	1019	15.00	12.78	78		Cum	2/10	310	2'	325	4'	10m.		

OBSERVED DEPTH(m)	TEMP °C	SALINITY ‰	DENSITY σ <sub>t</sub>	SND VEL m/sec
0	16.29	33.45	24.51	1509.5
10	16.29	33.45	24.51	1509.7
19	16.28	33.45	24.51	1509.8
29	16.27	33.45	24.51	1509.9
48	13.08	33.25	25.04	1499.7
72	12.13	33.40	25.35	1497.1
97	11.60	33.52	25.52	1495.8
292	8.12	34.17	26.63	1487.0
489	6.47	34.29	26.95	1484.1
686	5.30	34.37	27.16	1482.7
1084	3.81	34.48	27.43	1483.4
1483	2.85	34.56	27.57	1486.1



CRUISE	STATION NUMBER		DATE (GMT)				LATITUDE	LONGITUDE	SONIC DEPTH METERS	WIND				
	ASSIGNED	CONSECUTIVE	MO	DAY	YR	HR	N	W		M/SEC	DIR			
056610	12A	9	12	9	66	23	32° 23.9	118° 11.8	1564	1.5	050			
ANEMO HGT	BAROMETER MBS	TEMPERATURE		HUMIDITY %	WW	CLOUD		SEA		SWELL		VSBY	WATER	
		DRY	WET			TYPE	AMT	DIR	AMT	DIR	AMT		COLOR	TRANS
	1022	21.67	18.33	72		Cir	2/10	---	calm	280	2	10m.		

OBSERVED DEPTH(m)	TEMP °C	SALINITY ‰	DENSITY σ <sub>t</sub>	SND VEL m/sec
0	16.64	33.48	24.46	1510.7
10	16.60	33.47	24.46	1510.7
20	16.58	33.47	24.46	1510.8
29	16.50	33.47	24.48	1510.7
49	13.80	33.29	24.93	1502.1
73	11.98	33.38	25.36	1496.5
98	11.04	33.55	25.72	1494.0
295	8.18	34.15	26.60	1487.3
492	6.60	34.27	26.92	1484.6
689	5.18	34.38	27.18	1482.3
1084	3.76	34.49	27.43	1483.2
1480	2.90	34.56	27.62	1486.3

NANSEN CAST DATA

DOUGLAS SEA AND SWELL CODES

Marsden Square 120:

30°-40° North

110°-120° West

Month: by number

Sub-Marsden Square 28:

32°-33° North

118°-119° West

Directions:

0 - Calm

1 - NE

2 - E

3 - SE

4 - S

5 - SW

6 - W

7 - NW

8 - N

Sea State Code

<u>Code</u>	<u>Height</u>	<u>Description</u>
0	0'	calm
1	<1'	smooth
2	1-3'	slight
3	3-5'	moderate
4	5-8'	rough
5	8-12'	very rough
6	12-20'	high
7	20-40'	very high
8	≥ 40'	mountainous
9	> 40'	phenomenal

Swell Code

<u>Code</u>	<u>Height</u>	<u>Wave Length</u>
0	0'	none
1	1-6'	0-600'
2	1-6'	over 600'
3	6-12'	0-300'
4	6-12'	300-600'
5	6-12'	over 600'
6	over 12'	0-300'
7	over 12'	300-600'
8	over 12'	over 600'
9	confused	







POSITION: 32 - 33 N 118 -119 W			MONTH: JANUARY			
DIRECTION	SPEED (BEAUFORT FORCE)					
	0-1	2-3	4	5-6	7-12	TOTAL
N	2.6	8.3	3.0	1.9	0.1	15.9
NE	1.7	4.1	1.3	0.6	0.1	7.6
E	1.3	3.7	0.9	0.6	0.1	6.7
SE	1.3	2.9	0.7	0.6	0.1	5.7
S	1.3	3.7	1.1	1.1	0.3	7.4
SW	1.1	4.3	1.8	0.7		7.9
W	1.7	9.0	4.4	2.8	0.5	18.3
NW	2.2	11.9	6.6	4.3	0.4	25.4
CALM	5.1					5.1
TOTAL	18.2	47.9	19.8	12.5	1.6	100.0

POSITION: 32 - 33 N 118 -119 W		MONTH: APRIL				
DIRECTION	SPEED (BEAUFORT FORCE)					
	0-1	2-3	4	5-6	7-12	TOTAL
N	1.1	2.5	1.1	0.8	0.1	5.6
NE	1.2	1.9	0.1			3.3
E	0.9	1.8	0.1	0.1		2.9
SE	0.8	2.6	0.7	0.3		4.3
S	1.4	4.7	1.4	0.6		8.1
SW	1.3	6.9	3.7	1.1	0.1	13.1
W	1.9	13.7	9.0	6.2	0.6	31.4
NW	1.8	10.2	7.3	7.0	0.6	26.9
CALM	4.4					4.4
TOTAL	14.8	44.3	23.4	16.1	1.4	100.0

POSITION: 32 - 33 N 118 -119 W			MONTH: FEBRUARY			
DIRECTION	SPEED (BEAUFORT FORCE)					
	0-1	2-3	4	5-6	7-12	TOTAL
N	2.4	7.2	2.6	1.6	0.2	14.0
NE	1.4	4.0	1.0	0.6		7.1
E	1.1	3.6	0.9	0.6		6.2
SE	1.2	2.7	1.0	0.9	0.2	6.0
S	1.1	3.5	1.0	0.7	0.2	6.5
SW	1.0	4.5	2.2	0.6	0.1	8.3
W	1.7	9.6	5.4	3.3	0.5	20.5
NW	1.6	11.3	7.7	5.2	0.8	26.6
CALM	4.8					4.8
TOTAL	16.4	46.4	21.8	13.5	1.9	100.0

POSITION: 32 -33 N 118 -119 W			MONTH: MAY			
DIRECTION	SPEED (BEAUFORT FORCE)					
	0-1	2-3	4	5-6	7-12	TOTAL
N	0.8	2.3	0.9	1.0	0.1	5.1
NE	0.8	1.0	0.1			1.9
E	0.9	1.6	0.2	0.1		2.7
SE	0.9	2.1	0.3	0.1		3.4
S	1.2	4.4	0.8	0.2		6.6
SW	1.4	7.3	2.8	1.4	0.1	13.0
W	2.0	16.8	10.2	6.0	0.4	35.4
NW	1.4	9.8	7.8	7.5	0.6	27.2
CALM	4.7					4.7
TOTAL	14.1	45.3	23.1	16.3	1.2	100.0

POSITION: 32 - 33 N 118 -119 W			MONTH: MARCH			
DIRECTION	SPEED (BEAUFORT FORCE)					
	0-1	2-3	4	5-6	7-12	TOTAL
N	1.8	4.7	1.4	1.1	0.1	9.1
NE	1.6	3.1	0.3	0.2		5.2
E	1.1	2.4	0.3	0.3		4.2
SE	0.9	2.7	0.6	0.4	0.1	4.8
S	1.1	4.4	1.2	0.5	0.1	7.3
SW	1.3	6.1	3.2	1.1	0.1	11.7
W	1.7	12.3	7.2	5.6	0.8	27.6
NW	1.9	9.9	7.1	6.2	0.7	25.7
CALM	4.4					4.4
TOTAL	15.7	45.7	21.3	15.4	1.9	100.0

POSITION: 32 - 33 N 118 -119 W		MONTH: JUNE				
DIRECTION	SPEED (BEAUFORT FORCE)					
	0-1	2-3	4	5-6	7-12	TOTAL
N	0.9	1.9	0.8	0.6		4.2
NE	0.7	0.8	0.1	0.1		1.6
E	0.9	1.6	0.1			2.7
SE	1.1	2.8	0.5	0.1		4.4
S	1.5	6.3	1.4	0.1		9.3
SW	1.8	8.3	3.8	2.0		15.9
W	2.6	17.0	8.0	4.4	0.2	32.2
NW	1.6	9.1	6.6	6.6	0.6	24.5
CALM	5.2					5.2
TOTAL	16.2	47.8	21.2	13.9	0.9	100.0

# MONTHLY WIND FORCE DATA

POSITION: 32 - 33 N 118 -119 W			MONTH: JULY			
DIRECTION	SPEED (BEAUFORT FORCE)					
	0-1	2-3	4	5-6	7-12	TOTAL
N	1.0	2.2	1.0	0.6		4.8
NE	0.7	0.7	0.1			1.5
E	0.7	1.0	0.1			1.8
SE	0.9	2.5	0.4			3.9
S	1.6	5.4	0.9	0.1		8.0
SW	1.4	6.4	1.2	0.3		9.3
W	3.1	20.3	8.4	3.8	0.1	35.7
NW	2.0	12.8	8.2	5.1	0.2	28.3
CALM	6.7					6.7
TOTAL	18.2	51.2	20.3	9.9	0.4	100.0

POSITION: 32 - 33 N 118 -119 W		MONTH: OCTOBER				
DIRECTION	SPEED (BEAUFORT FORCE)					
	0-1	2-3	4	5-6	7-12	TOTAL
N	2.2	5.3	1.3	0.9		9.7
NE	1.6	2.4	0.2	0.1		4.3
E	1.1	2.2	0.5	0.3	0.1	4.2
SE	1.1	2.3	0.3	0.1		3.8
S	1.3	4.2	0.6	0.2		6.3
SW	1.4	6.1	2.8	0.7		11.0
W	2.5	14.4	6.4	2.7	0.2	26.2
NW	2.5	13.6	7.4	4.8	0.2	28.5
CALM	5.9					5.9
TOTAL	19.6	50.5	19.5	9.8	0.5	99.9

POSITION: 32 ~33 N 118 ~ 119 W			MONTH: AUGUST			
DIRECTION	SPEED (BEAUFORT FORCE)					TOTAL
	0-1	2-3	4	5-6	7-12	
N	1.1	2.4	0.9	0.6		5.0
NE	0.7	0.7	0.1			1.5
E	0.9	1.2	0.1			2.2
SE	0.9	1.7	0.2			2.9
S	1.3	4.6	0.8	0.1		6.7
SW	1.6	7.3	3.4	1.4		13.7
W	3.2	18.3	9.1	3.3	0.1	33.9
NW	2.3	12.4	8.2	4.5	0.2	27.5
CALM	6.6					6.6
TOTAL	18.5	48.7	22.6	9.9	0.3	100.0

POSITION: 32 - 33 N 118 - 119 W		MONTH: NOVEMBER				
DIRECTION	SPEED (BEAUFORT FORCE)					
	0-1	2-3	4	5-6	7-12	TOTAL
N	2.8	7.5	2.8	1.1	0.1	14.3
NE	1.8	4.2	0.9	0.8	0.1	7.8
E	1.5	3.3	0.7	0.4		5.9
SE	1.1	2.1	0.4	0.1		3.8
S	1.1	3.4	0.7	0.2		5.4
SW	1.1	5.2	1.8	0.4		8.5
W	2.1	10.5	4.4	2.5	0.4	19.9
NW	2.6	13.8	7.3	4.4	0.5	28.5
CALM	5.9					5.9
TOTAL	20.0	50.0	19.0	9.9	1.1	100.0

POSITION: 32 - 33 N 118 -119 W			MONTH: SEPTEMBER			
DIRECTION	SPEED (BEAUFORT FORCE)					
	0-1	2-3	4	5-6	7-12	TOTAL
N	1.5	3.1	1.2	1.2	0.1	7.1
NE	1.2	1.1	0.1			2.4
E	1.0	1.6	0.1			2.8
SE	0.8	1.8	0.2	0.1	0.1	3.1
S	1.1	3.3	0.6	0.1		5.1
SW	1.5	6.0	3.7	1.5		12.8
W	2.7	15.2	7.7	3.4	0.1	29.1
NW	2.4	12.8	9.2	7.2	0.4	32.0
CALM	5.6					5.6
TOTAL	17.8	45.0	22.8	13.6	0.8	100.0

POSITION: 32 - 33 N 118 - 119 W		MONTH: DECEMBER				
DIRECTION	SPEED (BEAUFORT FORCE)					
	0-1	2-3	4	5-6	7-12	TOTAL
N	3.1	7.7	2.4	1.5	0.2	14.9
NE	2.3	5.1	1.1	0.9	0.1	9.5
E	2.0	3.9	1.1	0.7	0.1	7.8
SE	1.6	3.9	1.2	0.7	0.1	7.5
S	1.4	3.7	0.8	0.6	0.1	6.6
SW	1.4	4.9	1.5	0.5	0.1	8.4
W	2.1	7.9	3.3	2.0	0.4	15.6
NW	2.8	11.9	5.1	2.9	0.4	23.1
CALM	6.6					6.6
TOTAL	23.3	48.9	16.4	9.9	1.5	100.0



## APPENDIX B

### CURRENT DATA

Current Meter Record and Tide Height, 5-Day Record,  
Polar Coordinate Histograms, Histograms of Rotor Speed, and Scatter Plots

TITLE: <b>FILM PROCESSING AND READING LOG*</b>		410119
<b>FILM IDENTIFICATION BY CUSTOMER</b>		Geodyne Assigned Film No.
Date <u>6 January 1967</u>		
Name <u>REILLY, WILLIAM Thomas G. Long</u>		
Address <u>Naval Oceanographic Office</u>		
<u>Washington D.C. 20390</u>		338-2A
		Customer's film identification
Type of Instrument <u>A-100 Current Meter</u>	and Serial No. <u>338</u>	
Motor RPM _____	Film Advance Speed <u>120 in/min</u>	No. Timer Cam Lobes <u>6</u>
<input type="checkbox"/> Continuous or, <input checked="" type="checkbox"/> Interval Record,		Time Interval Between Records <u>5</u> seconds
Cruise <u>056610</u>	Location: Lat. <u>33° 03.4'N</u>	Long. <u>118° 34.8'W</u> Meter Depth <u>36 feet above bottom</u>
Magnetic variation (+ = East, - = West) <u>14° 26' East</u>		
Recording started at <u>1841</u> Hours, <u>plus 8</u>	Time Zone, <u>24 Oct 1966</u>	Date
Recording ended at <u>1720</u> Hours, <u>plus 8</u>	Time Zone, <u>22 Nov 1966</u>	Date
Comments: Station 2 Alpha, Water depth 870 feet		

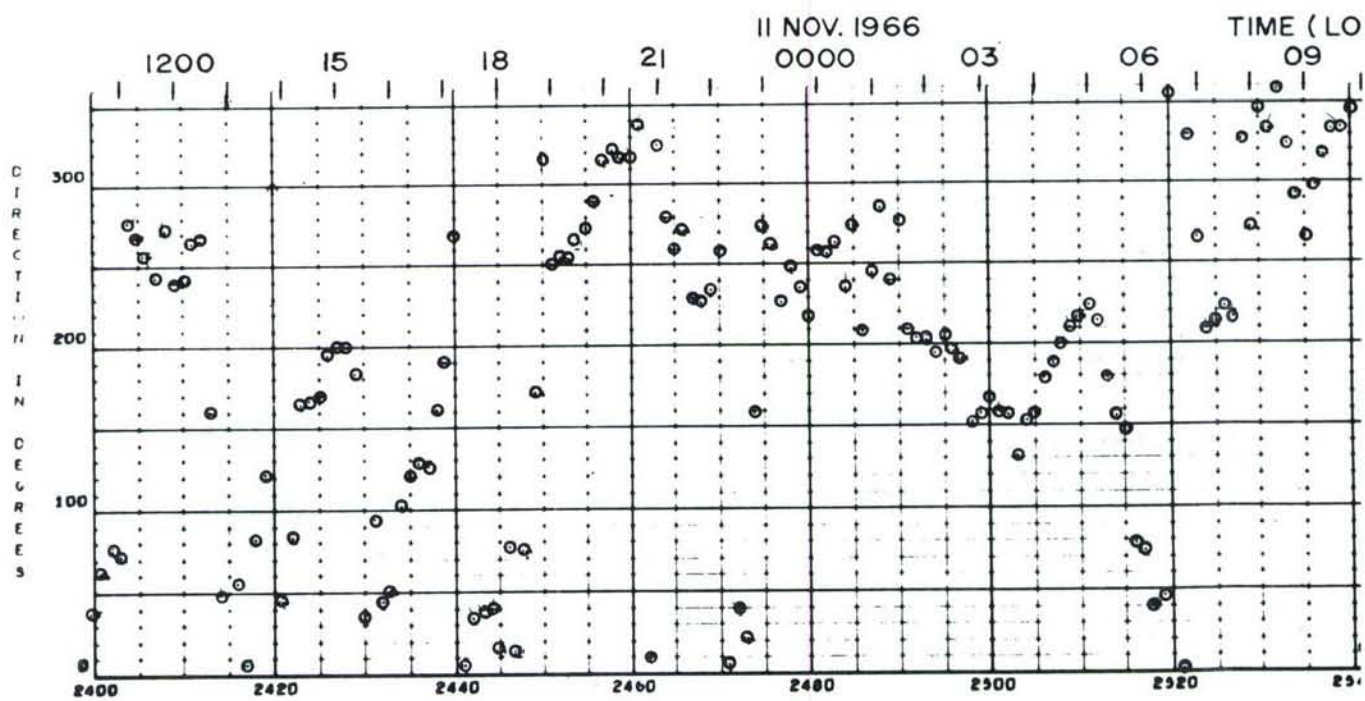
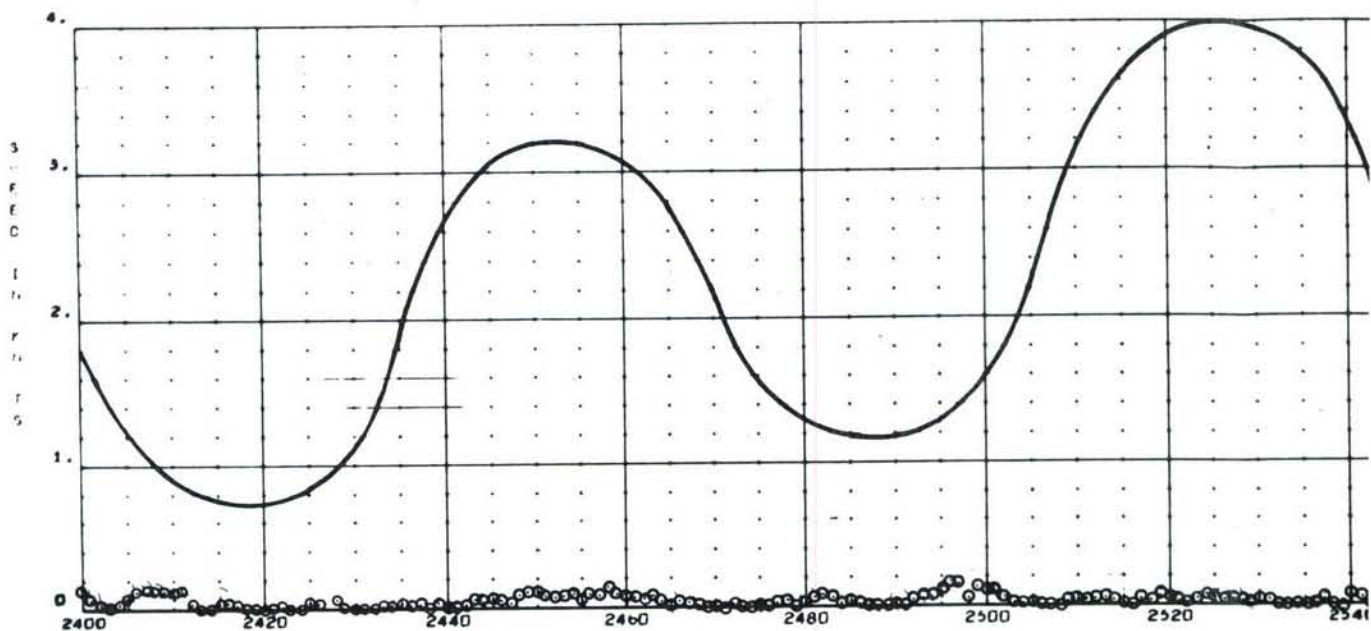
  

<b>INSTRUCTIONS TO GEODYNE</b>		Store at Geodyne or send to:
<input type="checkbox"/> Process original film, <input type="checkbox"/> 100', <input type="checkbox"/> 150'	<u>Naval Oceanographic Office</u>	
<input type="checkbox"/> Print for hand reading (clear edge)	<u>Washington D.C. 20390</u>	
<input type="checkbox"/> Print for automatic " (dark edge)	<u>Attn: Ronald Kopenski, Code 9100</u>	
<input checked="" type="checkbox"/> Analog strip chart record		
<input checked="" type="checkbox"/> Magnetic tape record		
Other instructions:		
1. Process only that data between tape strips on the film.		
2. Supply scatter plots and histogram plots.		
3. Supply plots of direction versus time and speed <u>versus time</u> <span style="float: right;">①</span>		
versus time <u>Customer's Order No.</u>		

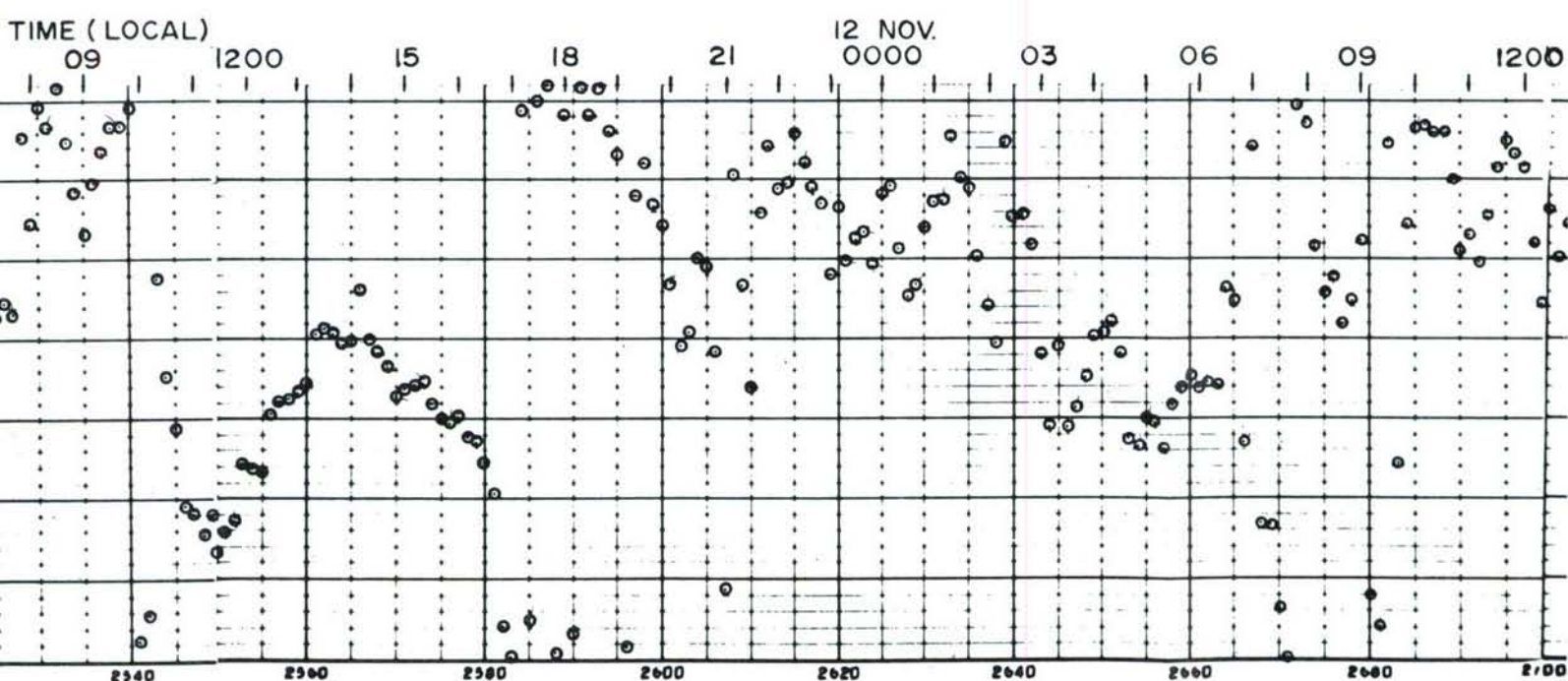
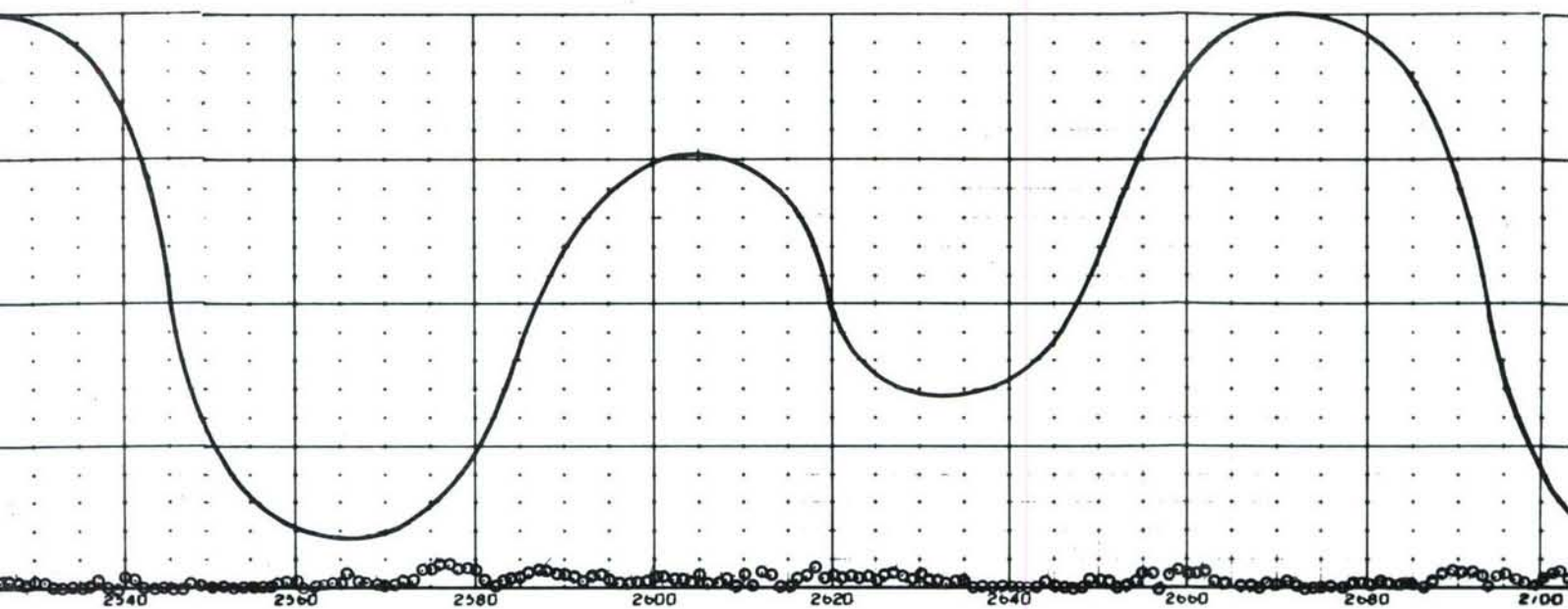
  

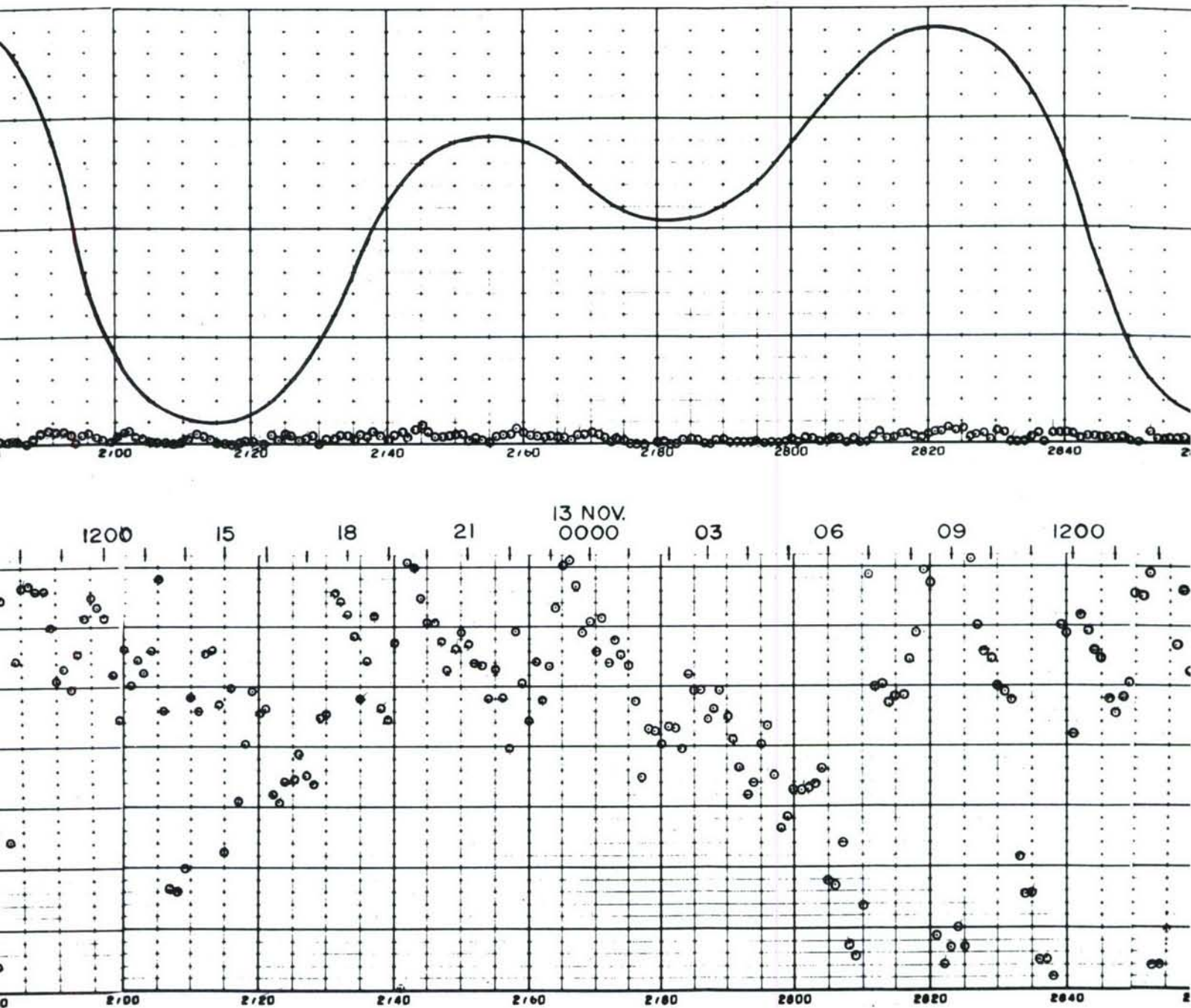
<b>FILM AND READING EVALUATION BY GEODYNE</b>			
Record started: foot mark <u>6869 + 11</u>	@ _____	hours, _____	Date _____
Record ended: foot mark <u>6909 + 31</u>	@ _____	hours, _____	Date _____
Total footage <u>40' + 20'</u> , Total elapsed time of record _____			
FILM EVALUATION: Alignment _____, Density _____			
Compass _____	Vane _____	Rotor _____	Time pulse _____
Comments:			
Strip Chart:			
Magnetic Tape: <u>000 519 Part 9</u>			
Date Completed: Film Processing _____		Reading <u>3-14-67</u>	

SITE 2A. DATA SHEET—834 FOOT DEPTH (36 FEET ABOVE  
BOTTOM) OCTOBER—NOVEMBER 1966



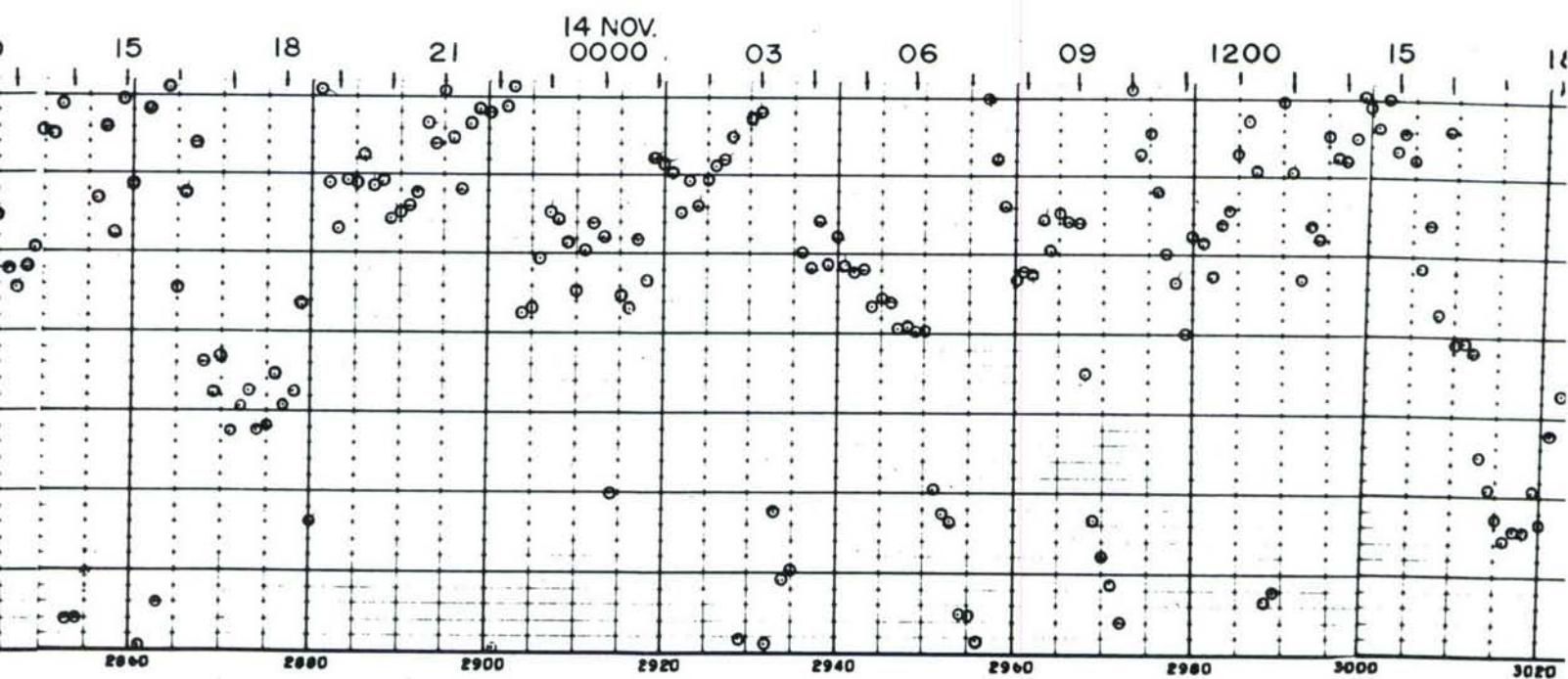
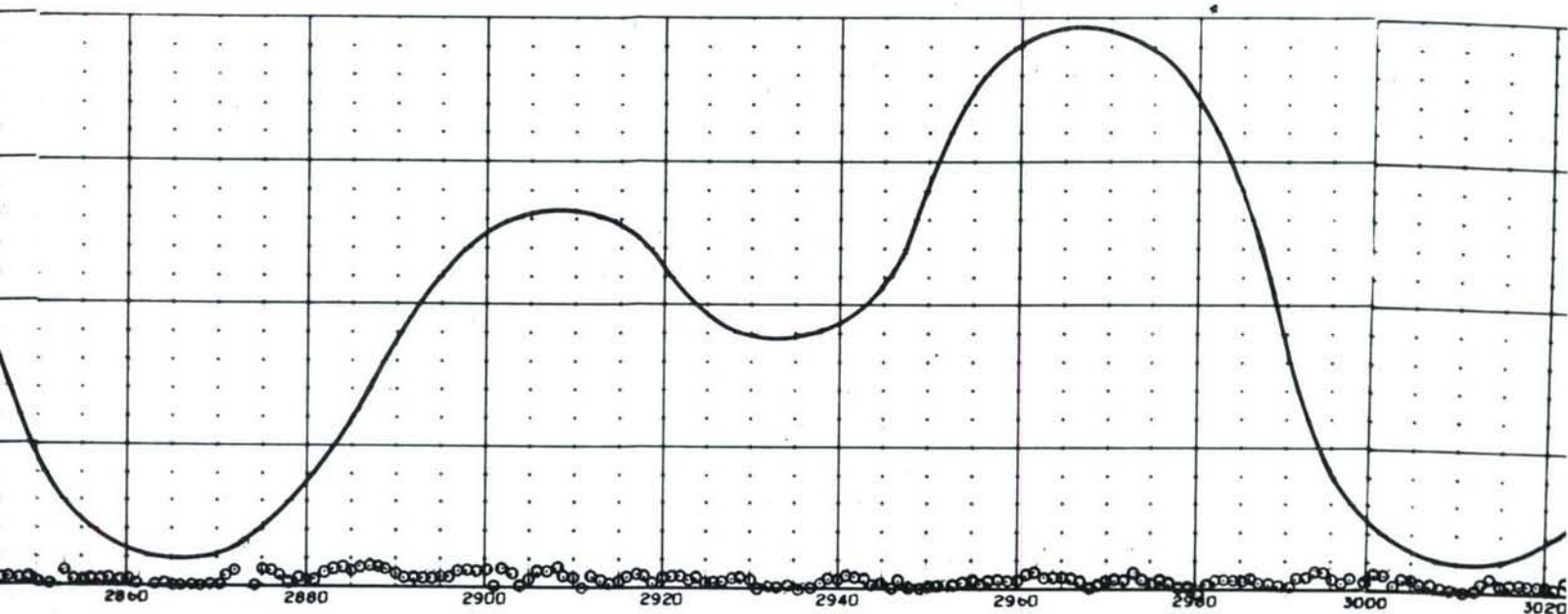




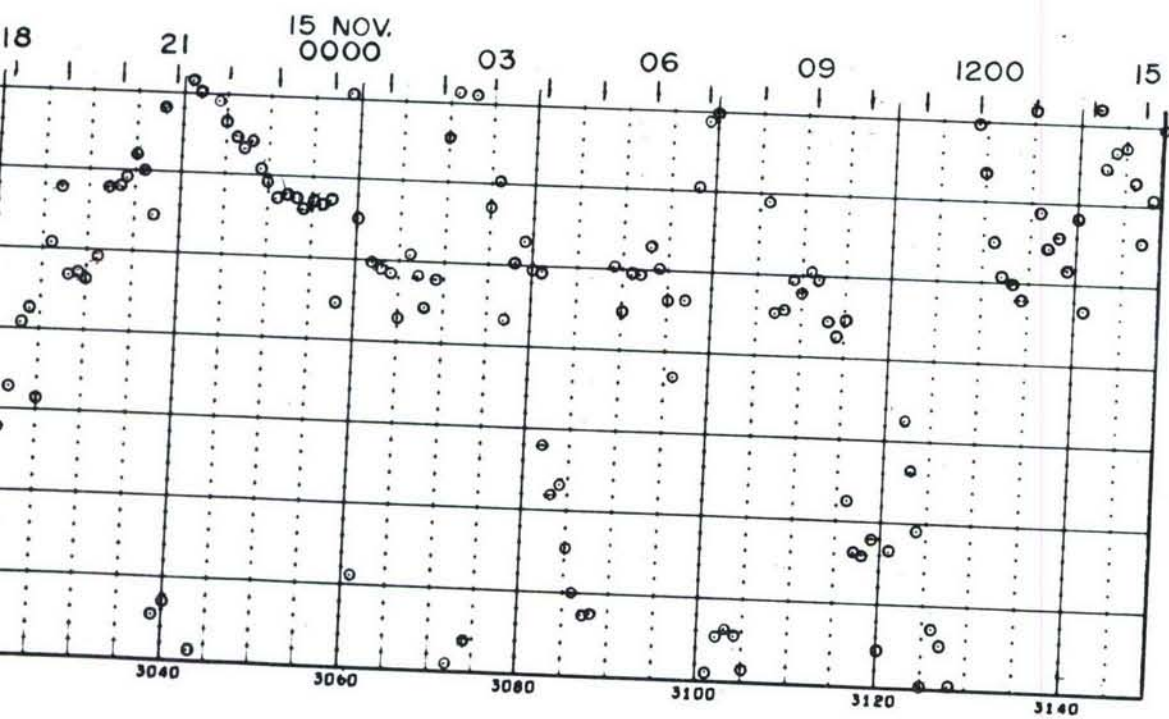
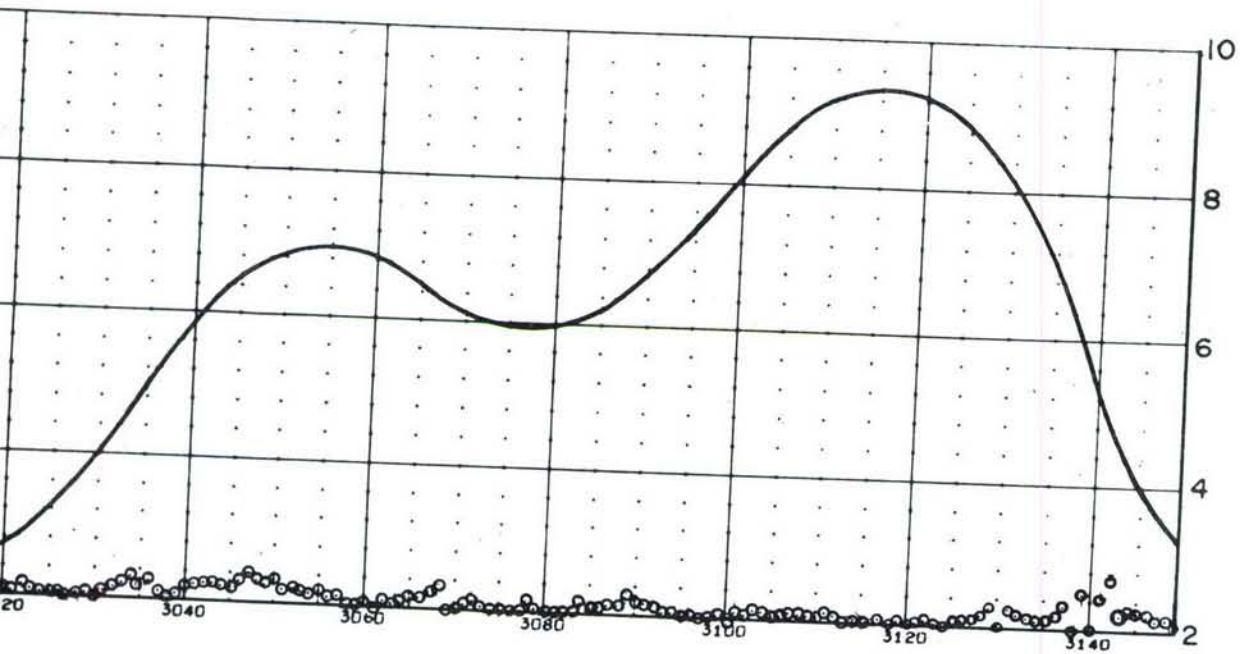


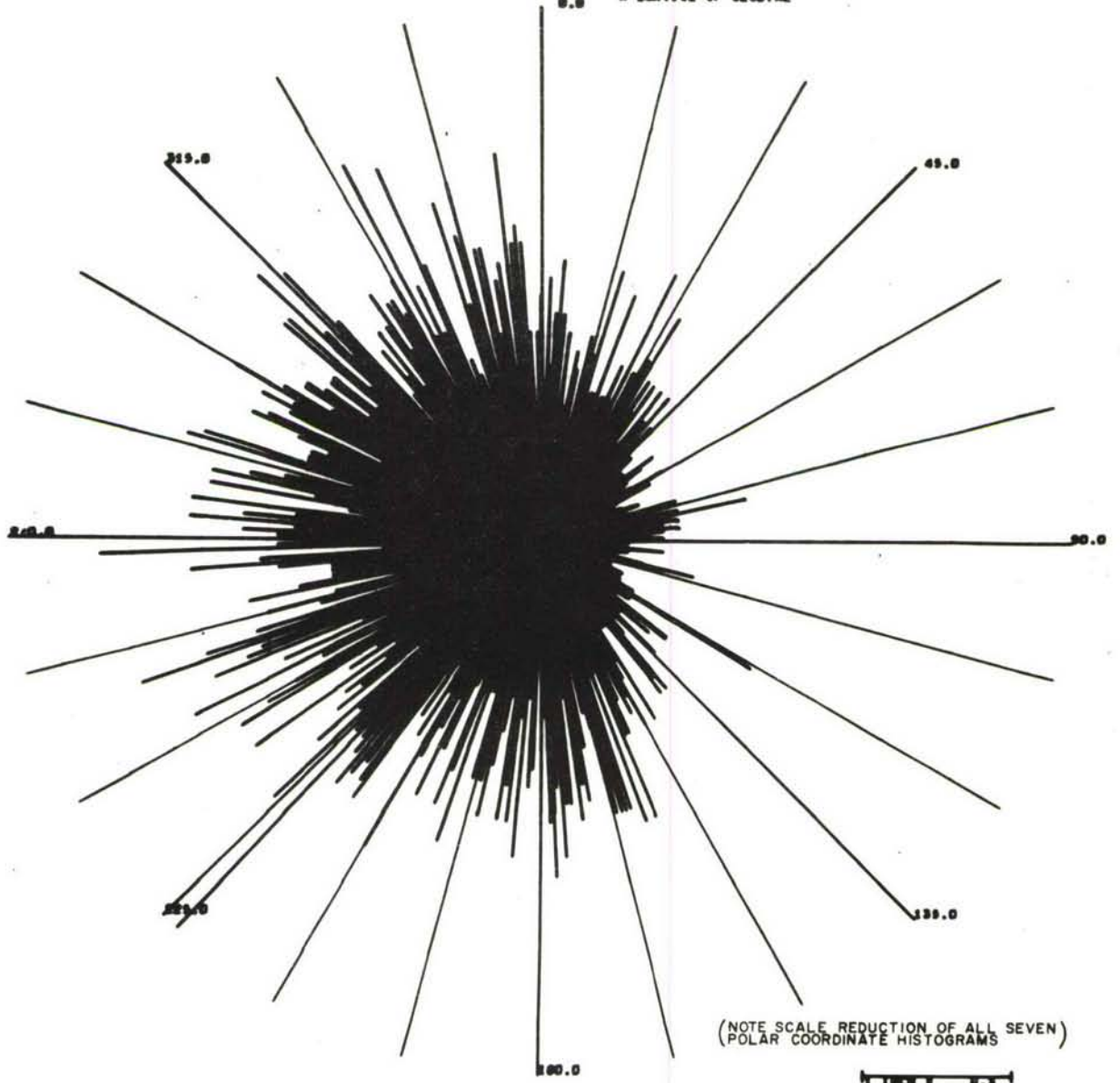
SITE 2A. CURRENT METER RECORD AND TIDE HEIGHT—5 DAY RECORD—834 FOOT DEPTH (36 FEET ABOVE BOTTOM)



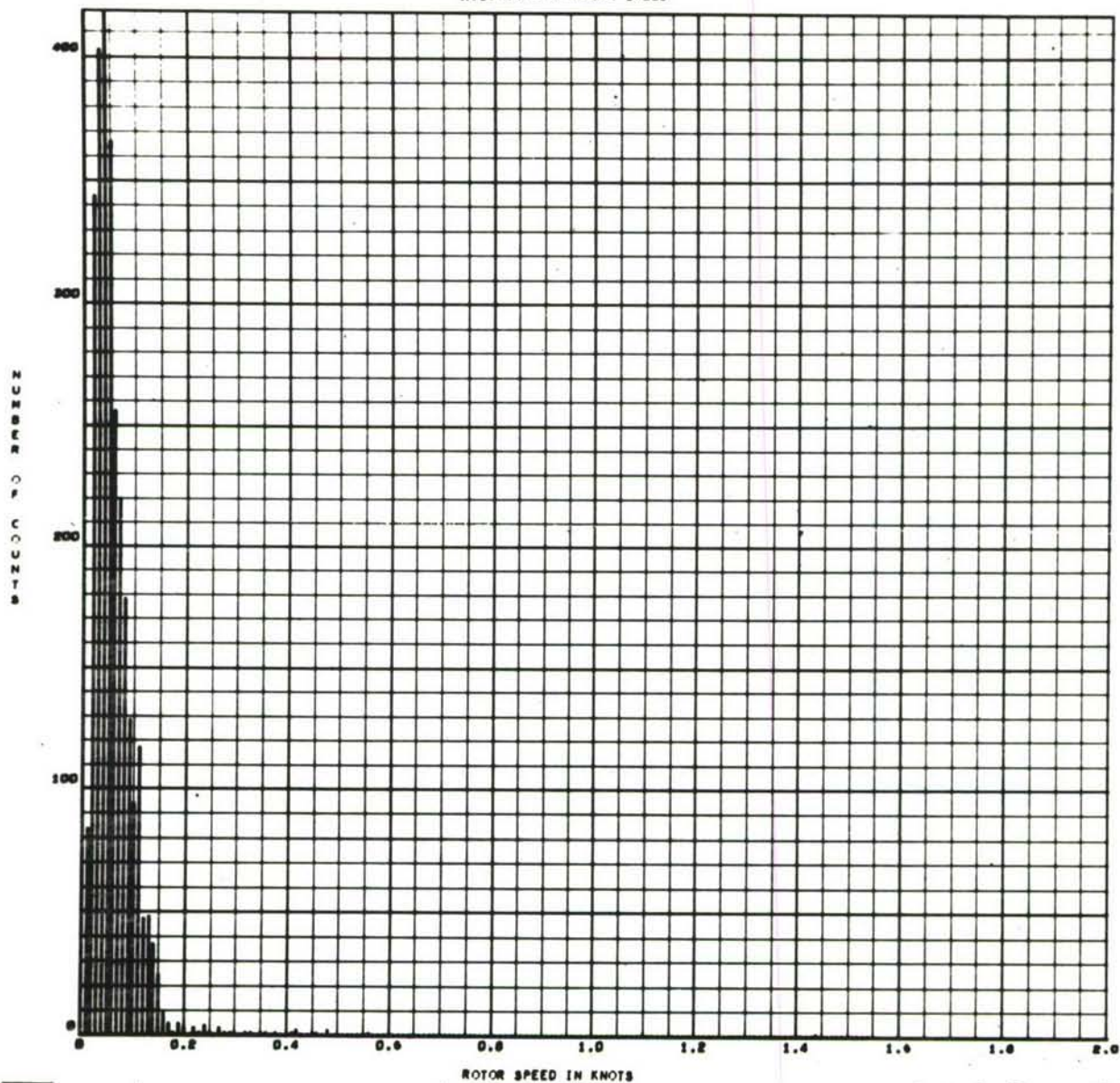






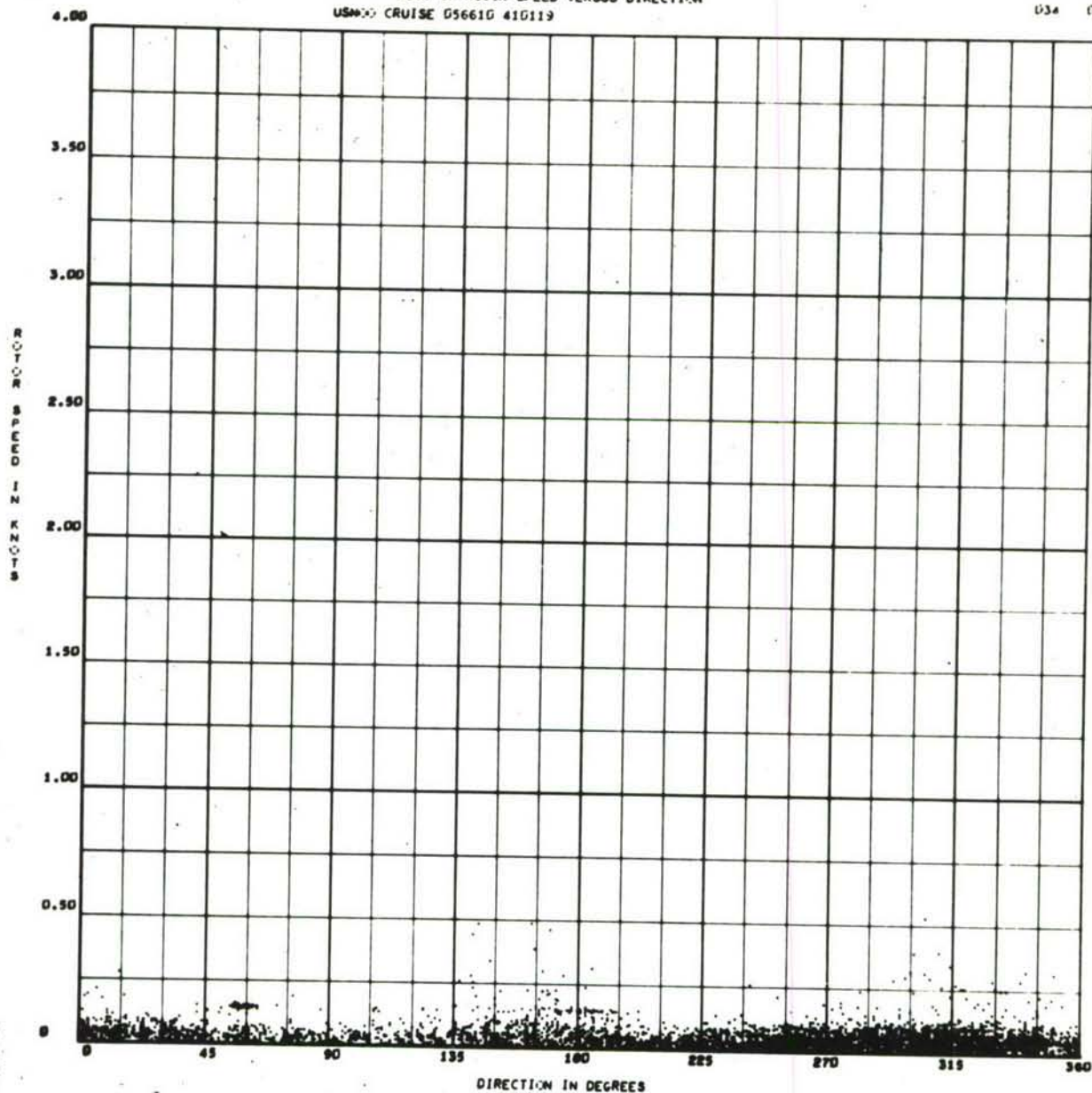


SITE 2A. POLAR COORDINATE HISTOGRAM 834 FOOT  
DEPTH (36 FEET ABOVE BOTTOM) OCTOBER—NOVEMBER 1966



SITE 2A HISTOGRAM OF ROTOR SPEED 834 FOOT DEPTH  
(36 FEET ABOVE BOTTOM) OCTOBER—NOVEMBER 1966





SITE 2A. SCATTER PLOT 834 FOOT DEPTH  
(36 FEET ABOVE BOTTOM) OCTOBER—NOVEMBER 1966

TITLE: FILM PROCESSING AND READING LOG\*410117  
Geodyne Assigned Film No.

## FILM IDENTIFICATION BY CUSTOMER

Date 9 January 1967Name ~~XXXXXXXXXXXX~~ Thomas G. LongAddress Naval Oceanographic OfficeWashington D.C. 20390

335-3B

Customer's film identification

Type of Instrument A-100 Current Meterand Serial No. 335Motor RPM \_\_\_\_\_, Film Advance Speed .120 in/sec, No. Timer Cam Lobes 6☐ Continuous or, ☒ Interval Record, Time Interval Between Records 5 secondsCruise 056610, Location: Lat. 33° 04.3'N Long. 118° 29.8'W Meter Depth 500 feetMagnetic variation (+ = East, - = West) 14° 26' EastRecording started at 1225 Hours, plus 8 Time Zone, 25 Oct 1966 DateRecording ended at 1700 Hours, plus 8 Time Zone, 4 Dec 1966 Date

Comments:

Station 3 Bravo, Water depth 3960 feet

## INSTRUCTIONS TO GEODYNE

Store at Geodyne or send to:

☐ Process original film, ☐ 100', ☐ 150'Naval Oceanographic Office☐ Print for hand reading (clear edge)Washington D.C. 20390☐ Print for automatic " (dark edge)Attn: Ronald Kopenski, Code 9100☒ Analog strip chart record☒ Magnetic tape record

Other instructions:

1. Process only that data between the tape strips on film.

2. Supply plots of direction versus time and speed versus time. (2)

3. Supply scatter plots and histogram plots.

Customer's Order No. \_\_\_\_\_

## FILM AND READING EVALUATION BY GEODYNE

Record started: foot mark 6775 + 10 @ \_\_\_\_\_ hours, \_\_\_\_\_ DateRecord ended: foot mark 6814 + 34 @ \_\_\_\_\_ hours, \_\_\_\_\_ DateTotal footage 39' 72", Total elapsed time of record \_\_\_\_\_

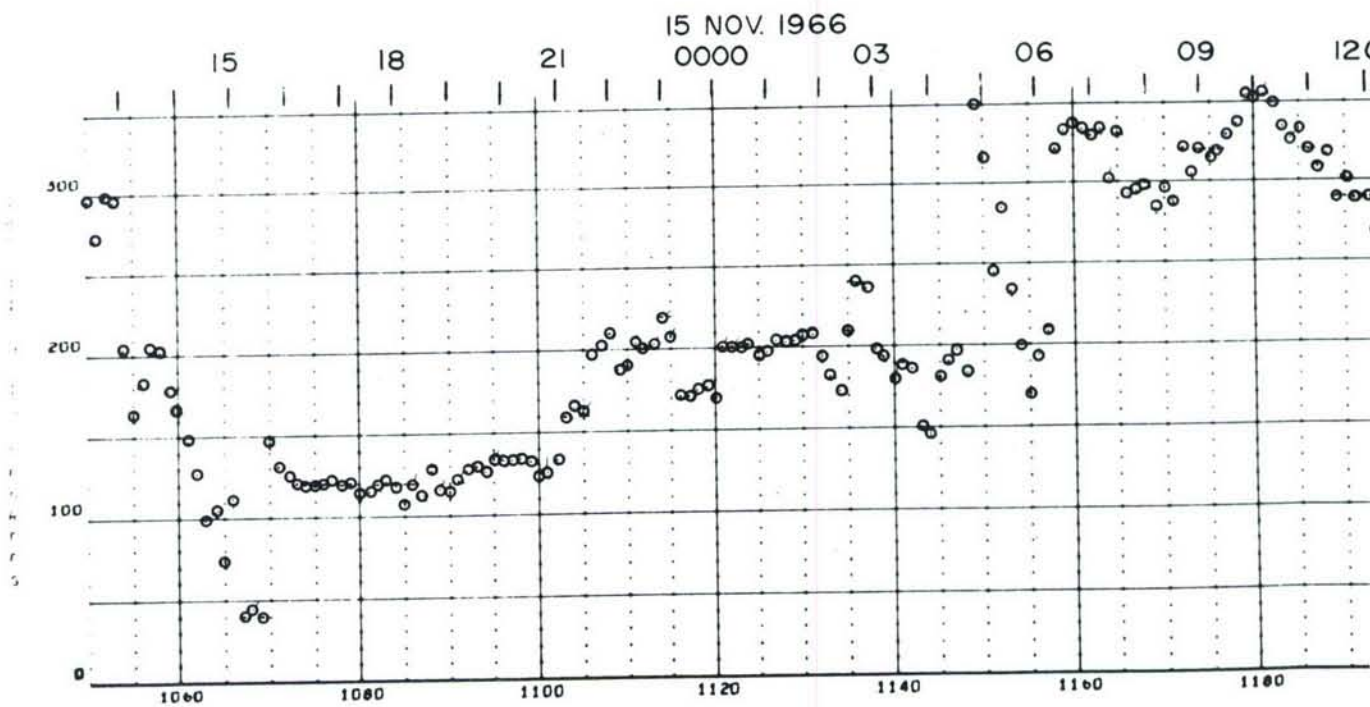
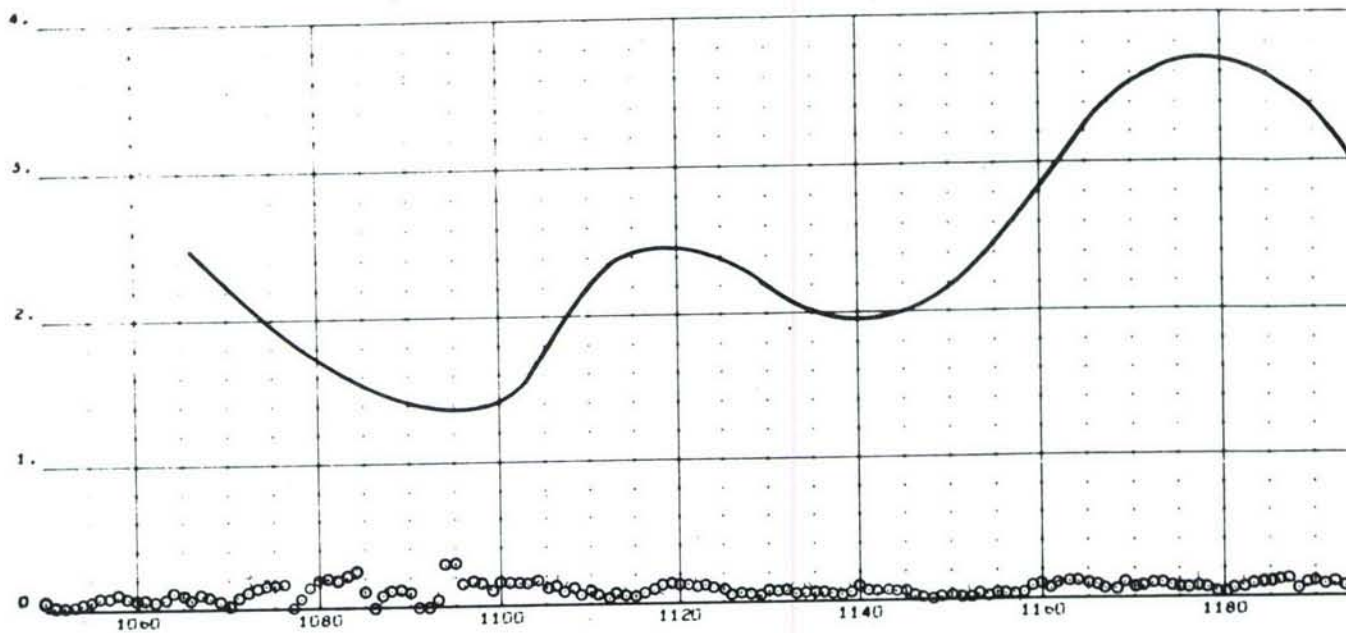
FILM EVALUATION: Alignment \_\_\_\_\_, Density \_\_\_\_\_

Compass \_\_\_\_\_, Vane \_\_\_\_\_, Rotor \_\_\_\_\_, Time pulse \_\_\_\_\_

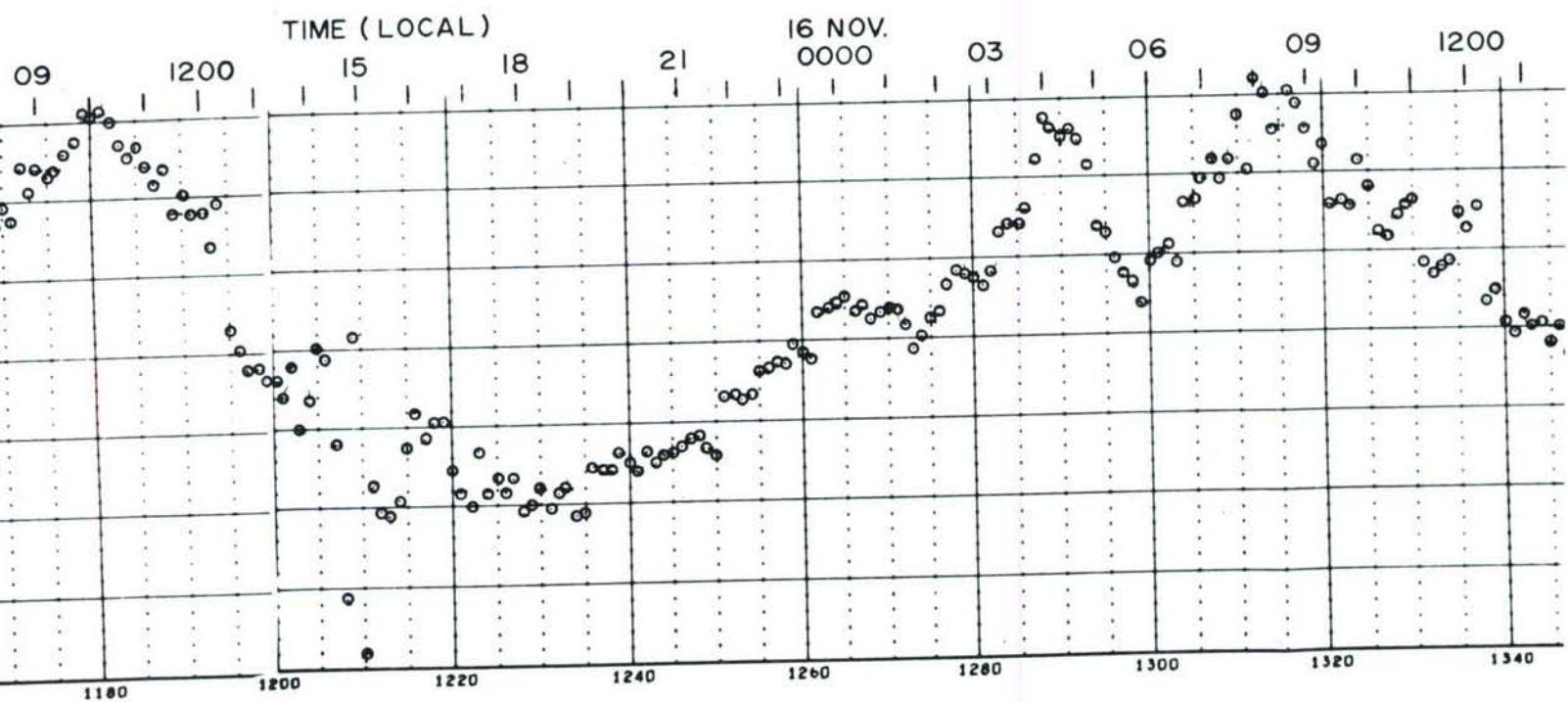
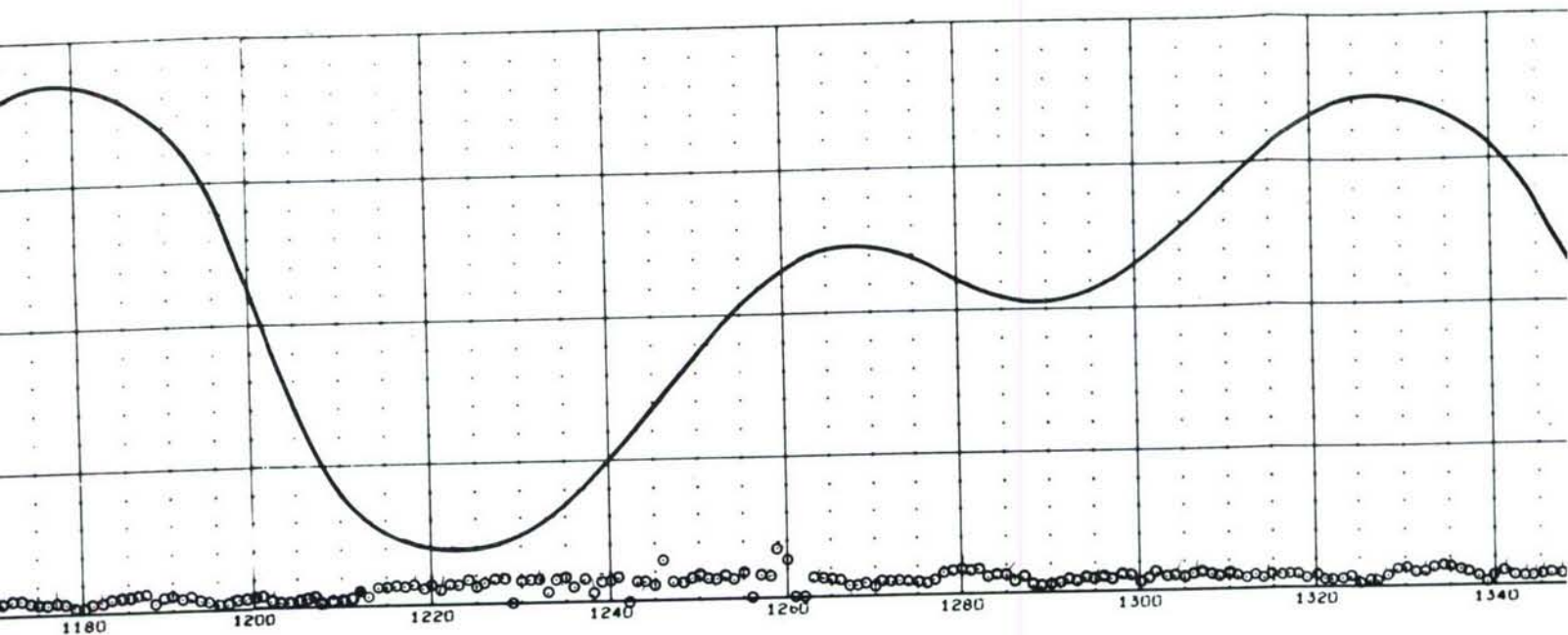
Comments: Continuous

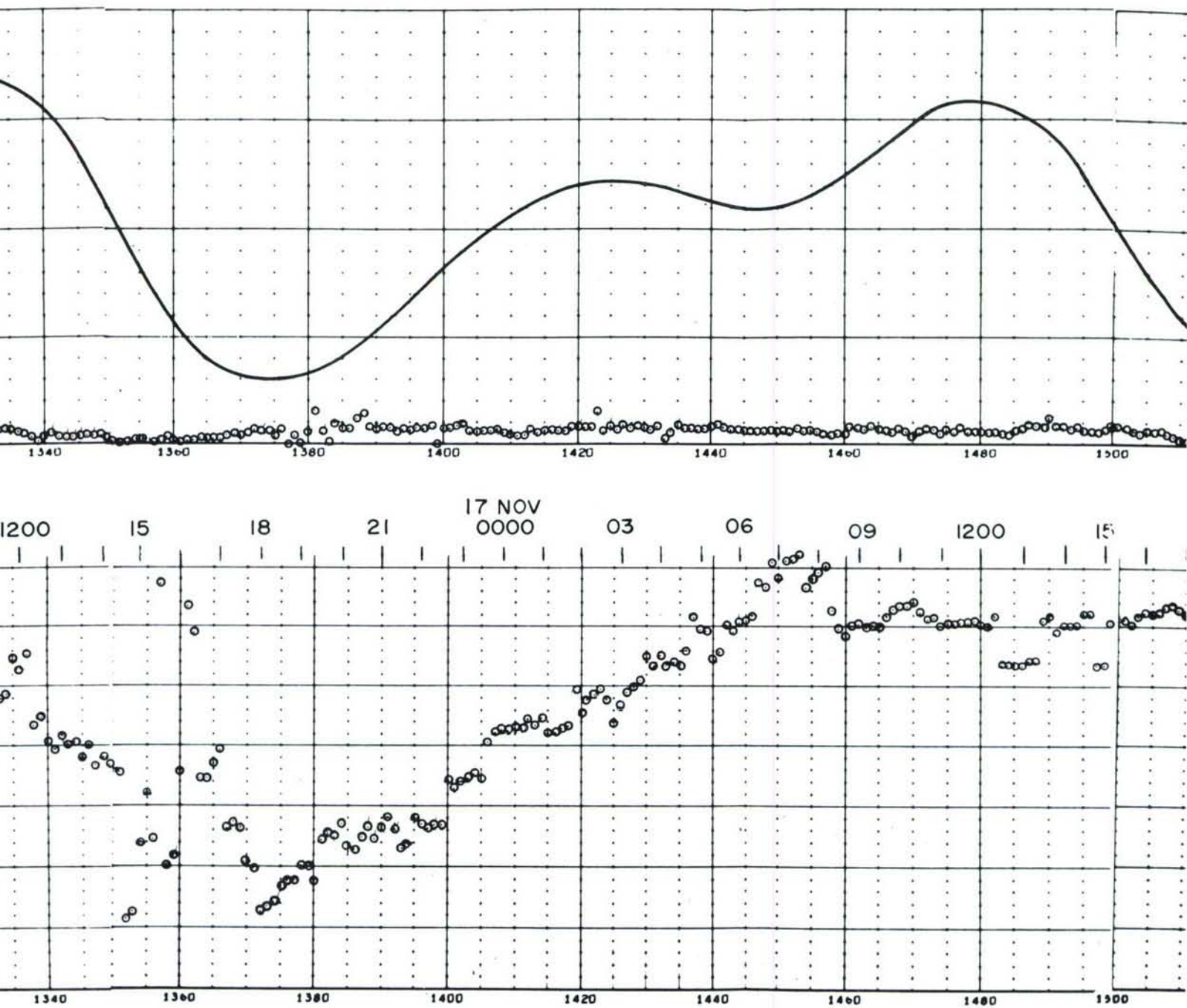
Strip Chart:

Magnetic Tape: 000 519 Part 7Date Completed: Film Processing \_\_\_\_\_, Reading 3-14-67SITE 3B. DATA SHEET—500 FOOT DEPTH (3460 FEET ABOVE  
BOTTOM) OCTOBER—DECEMBER 1966

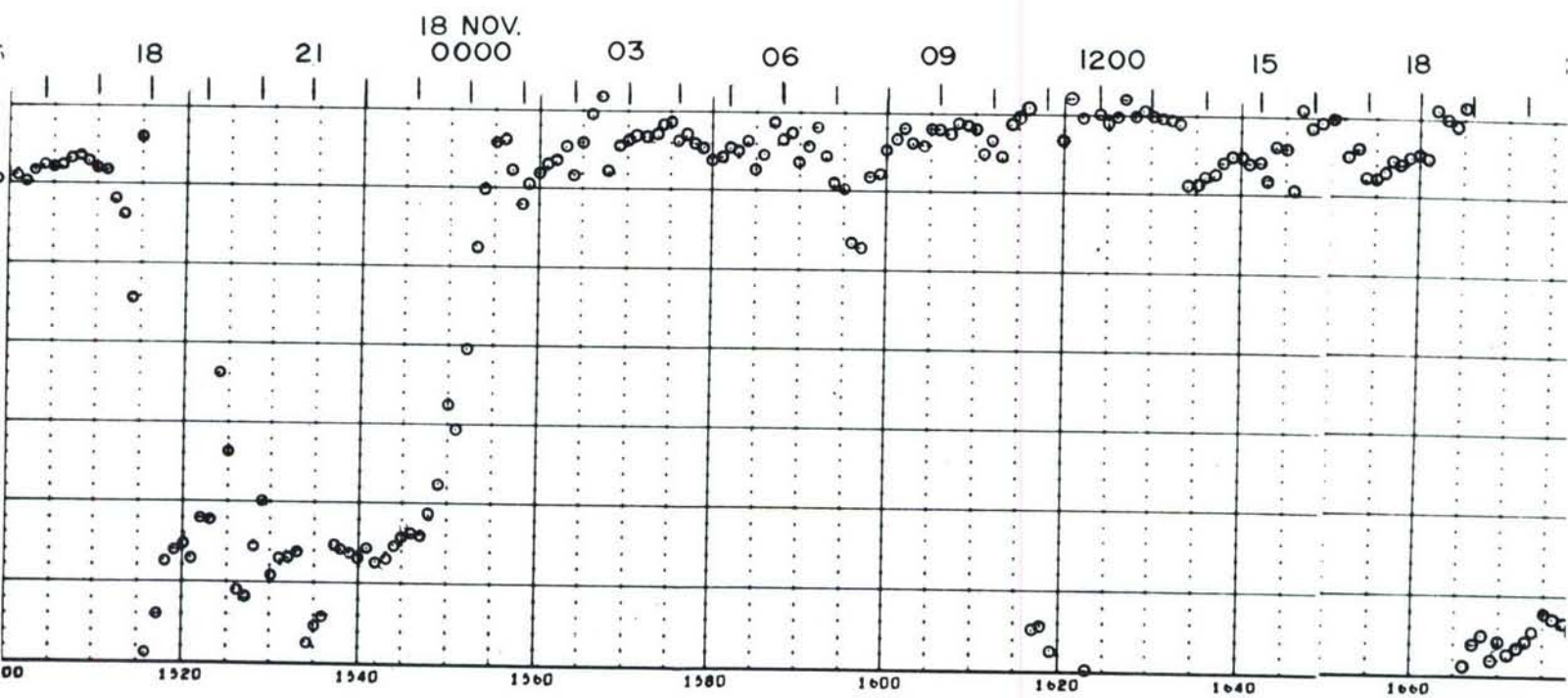
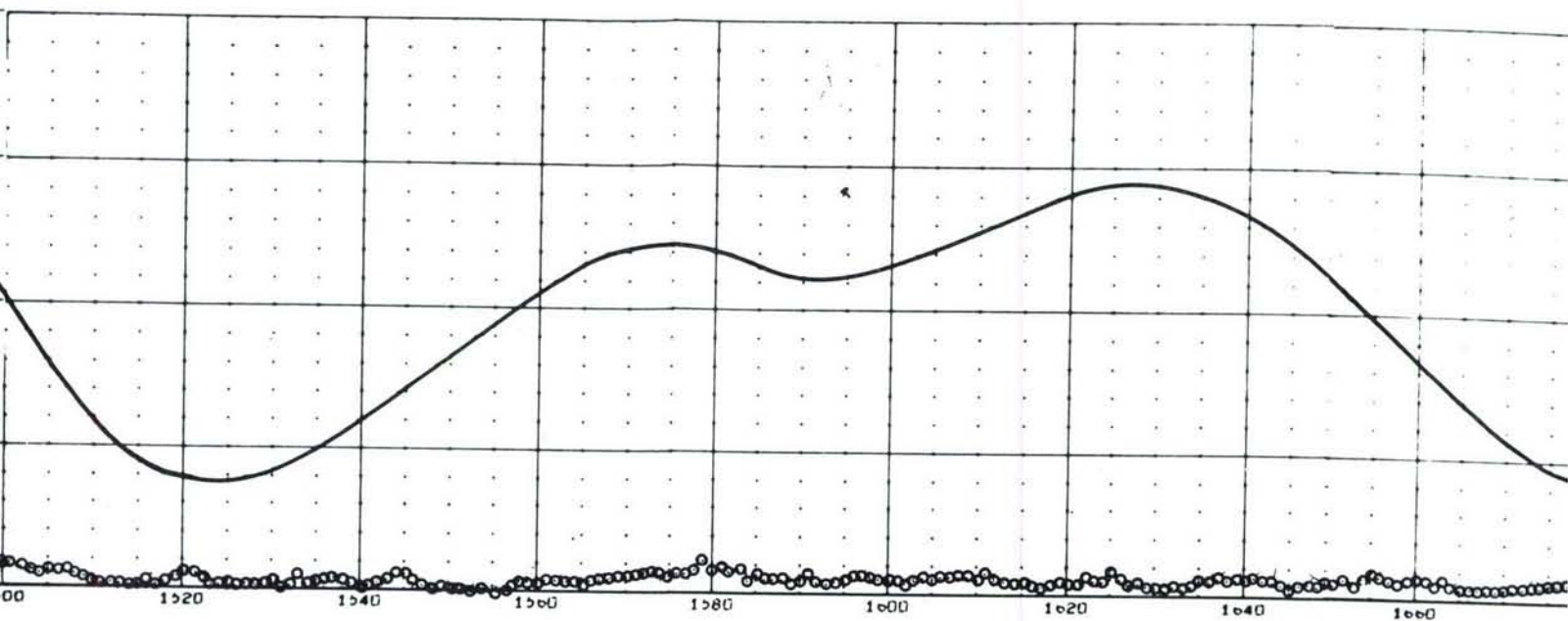




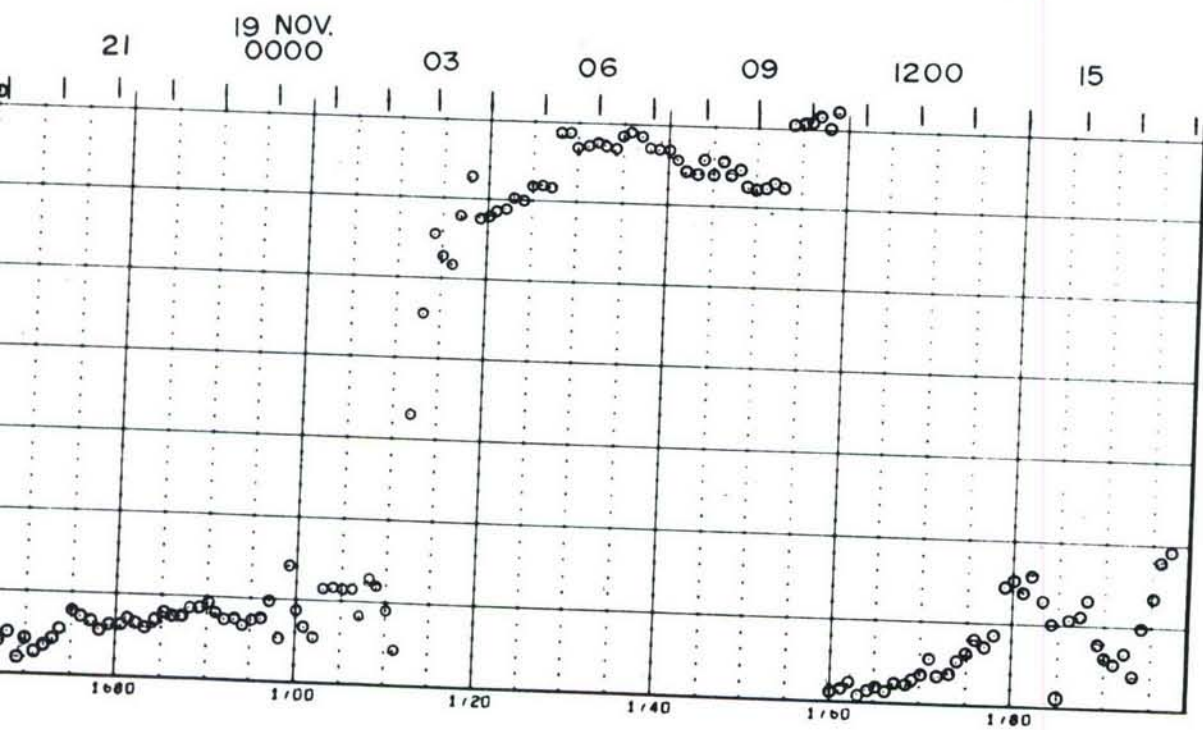
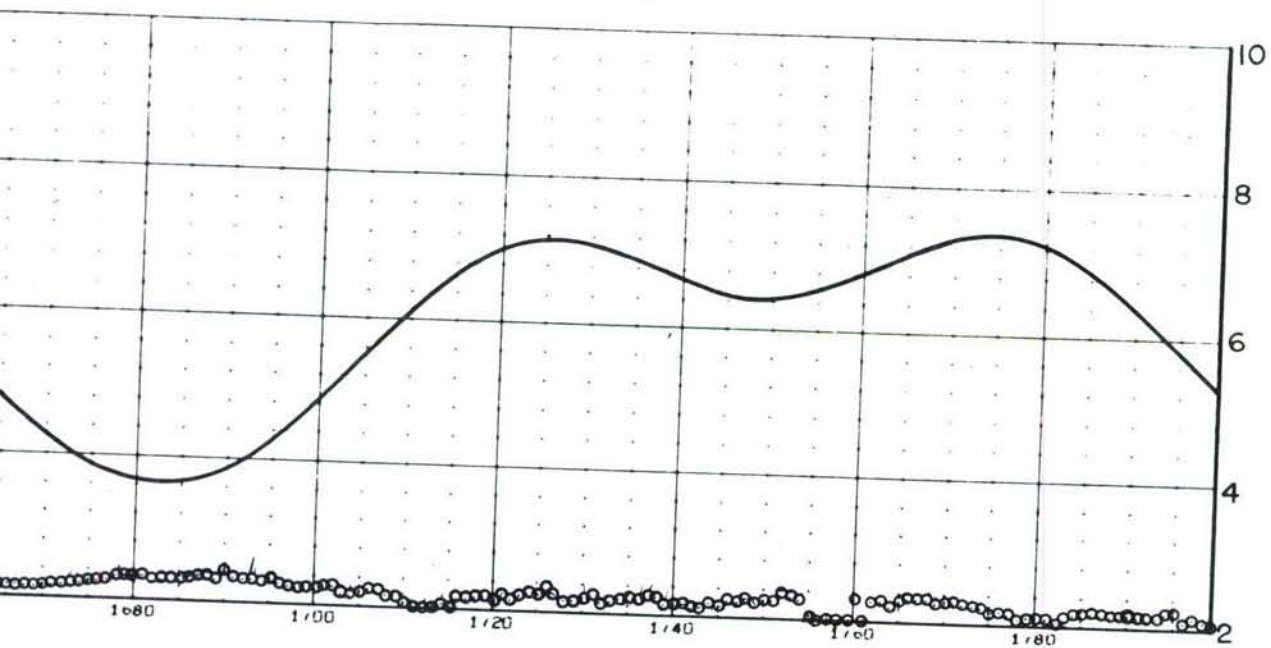


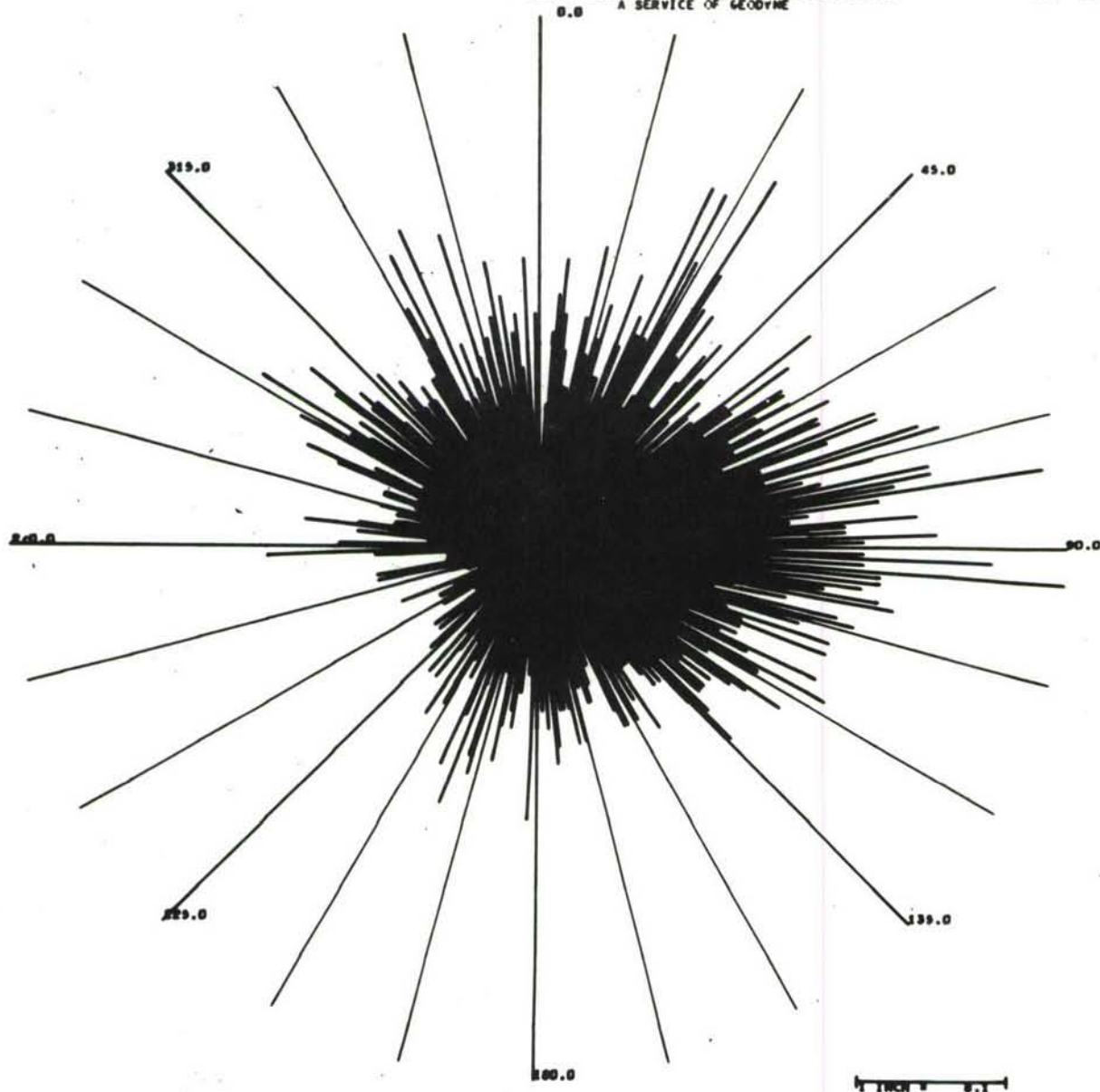


SITE 3B. CURRENT METER RECORD AND TIDE HEIGHT—5 DAY RECORD—500 FOOT DEPTH (3460 FEET ABOVE BOTTOM)

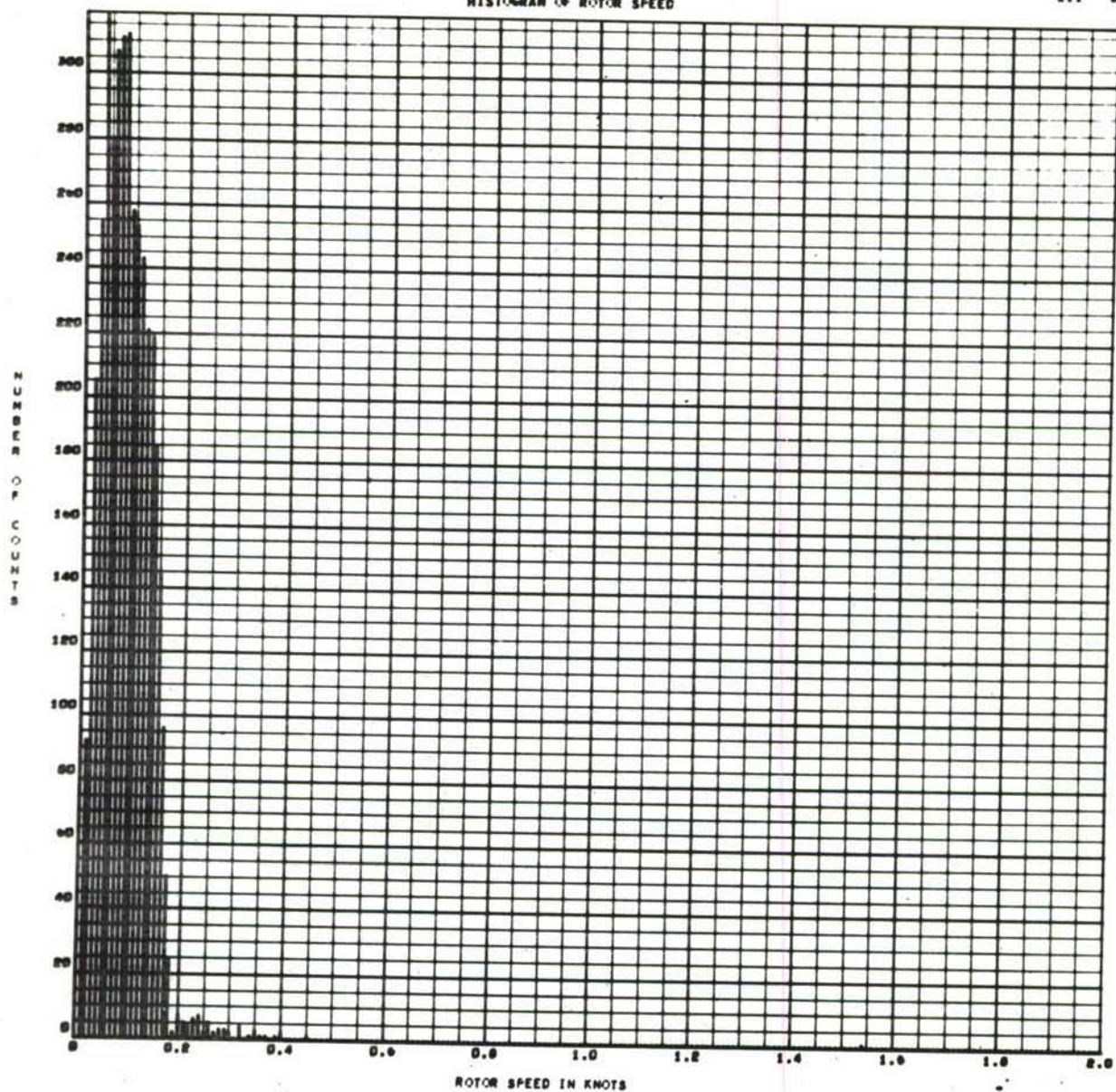








SITE 3B. POLAR COORDINATE HISTOGRAM 500 FOOT DEPTH  
(3460 FEET ABOVE BOTTOM) OCTOBER—DECEMBER 1966

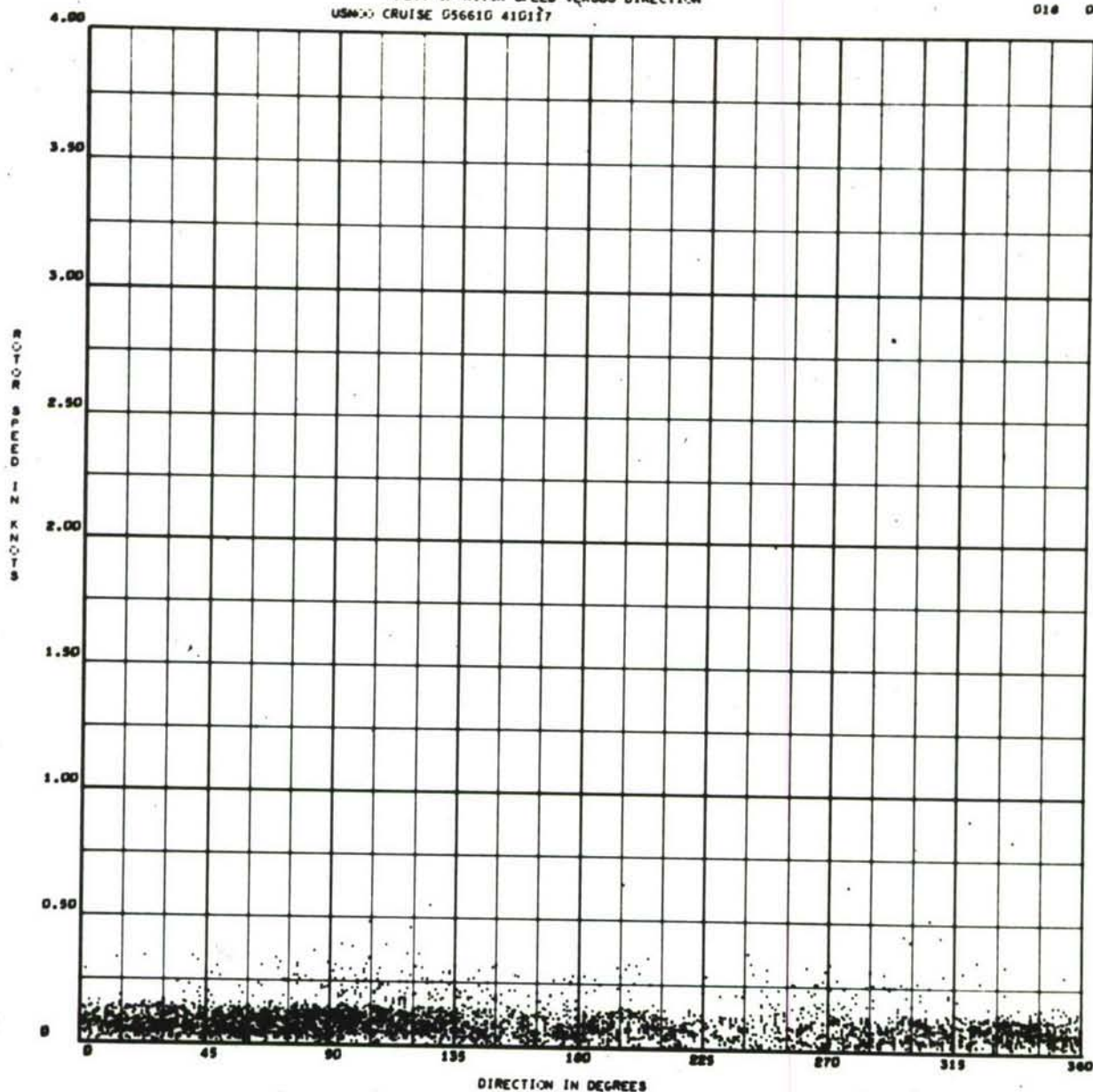


SITE 3B. HISTOGRAM OF ROTOR SPEED 500 FOOT DEPTH  
(3460 FEET ABOVE BOTTOM) OCTOBER—DECEMBER 1966



PLOT OF ROTOR SPEED VERSUS DIRECTION  
 USNCO CRUISE 056610 410177

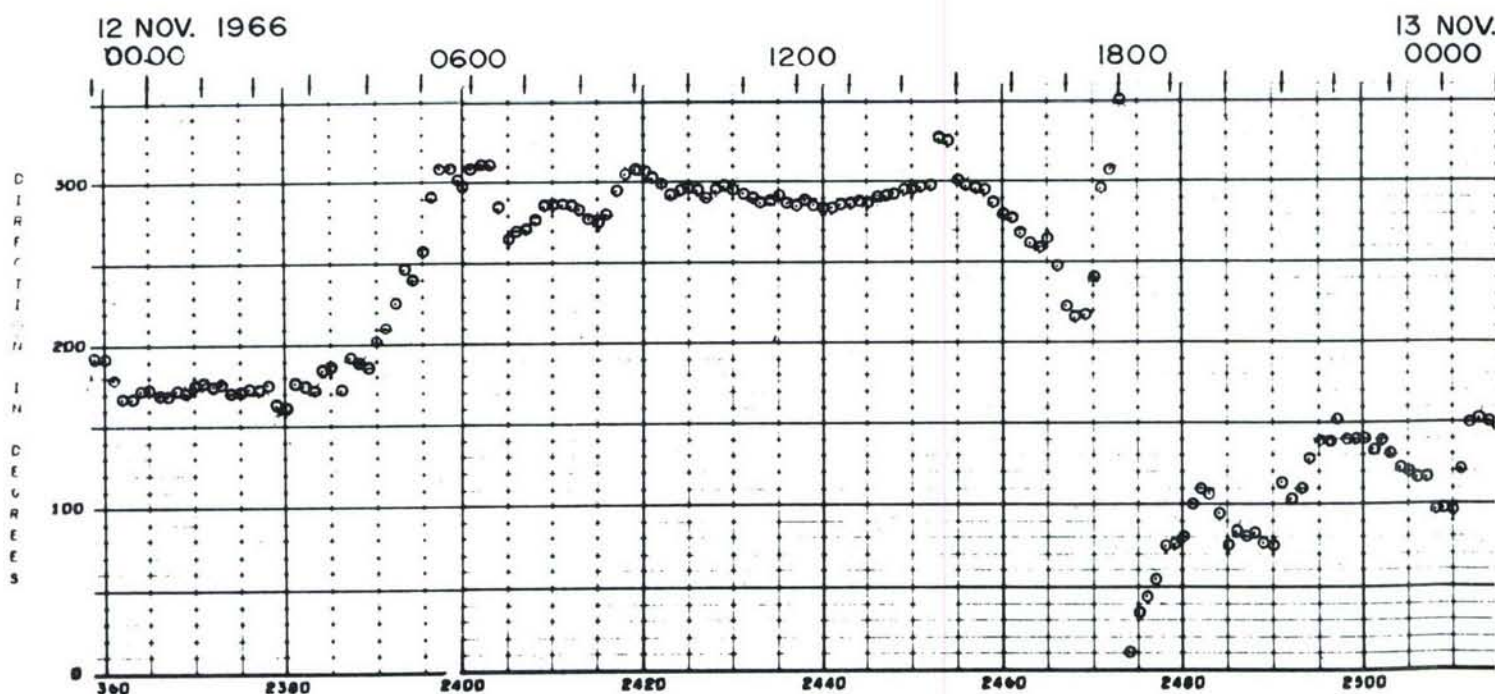
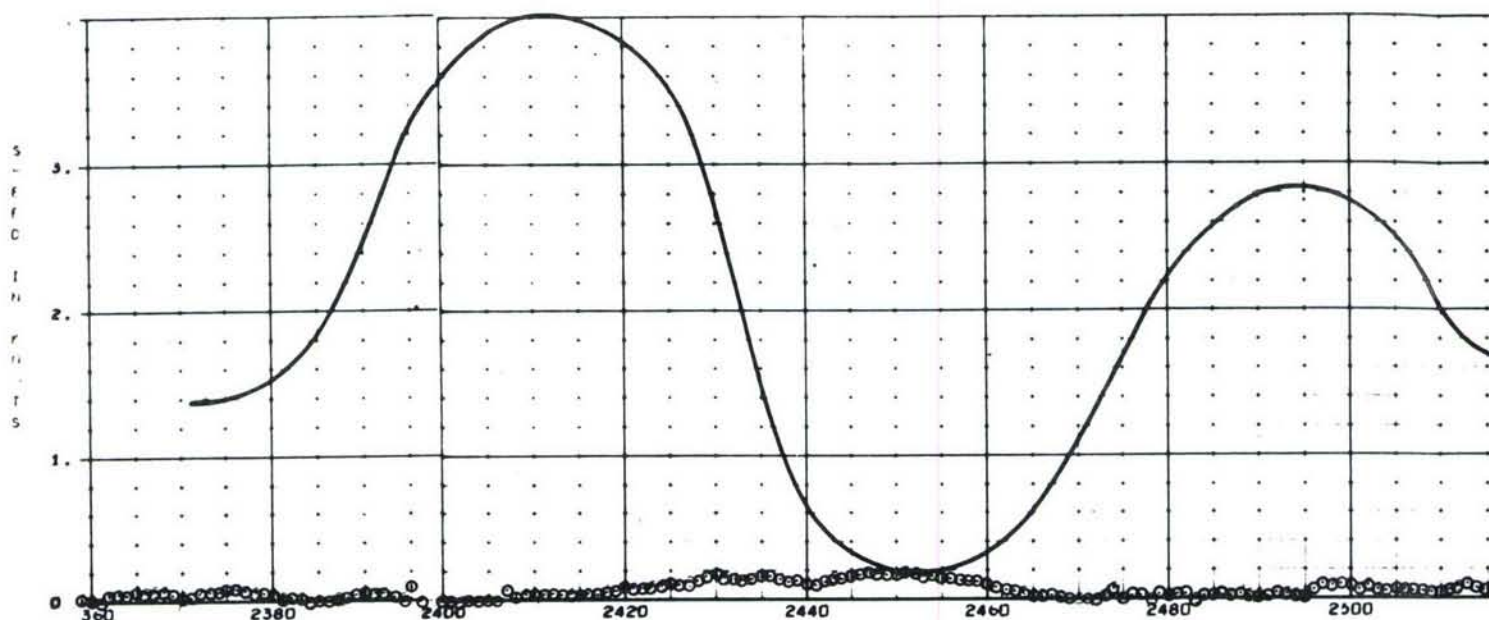
01# 000



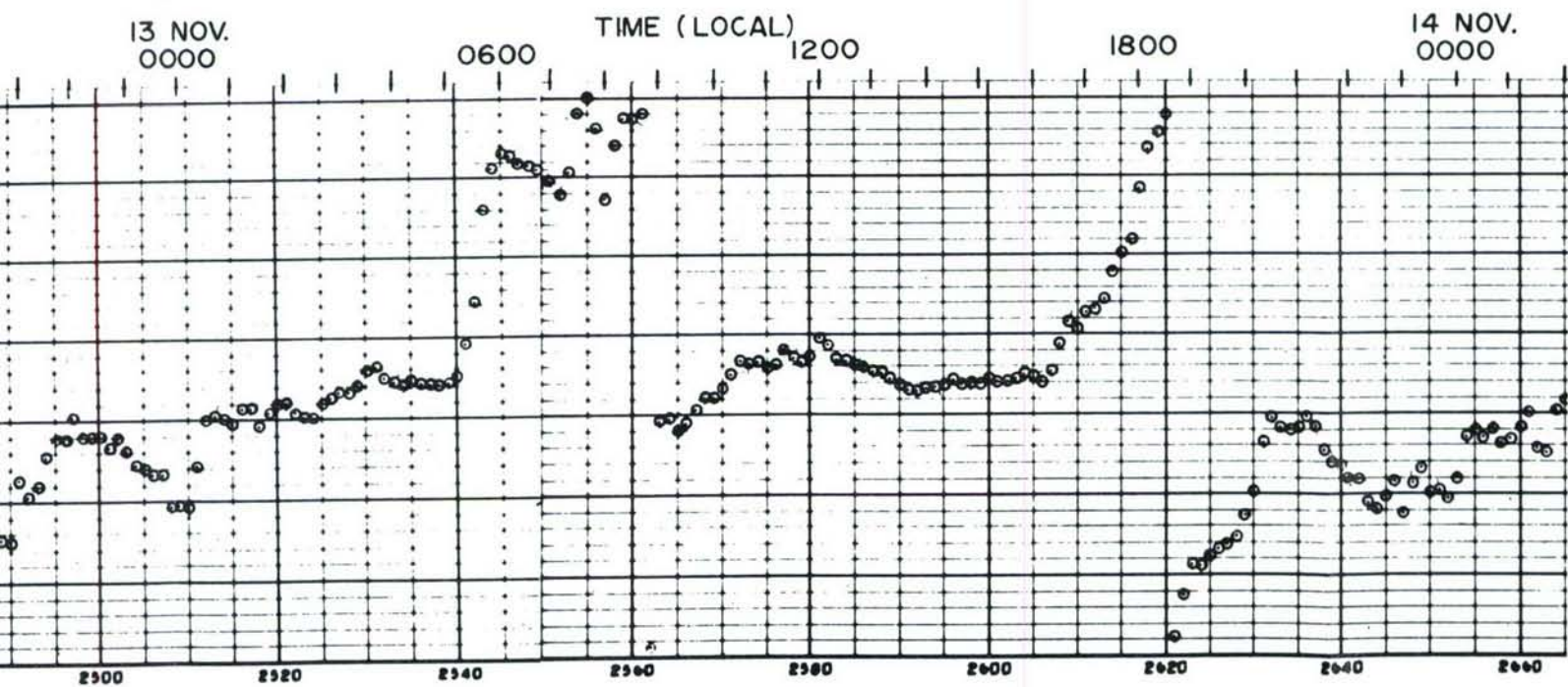
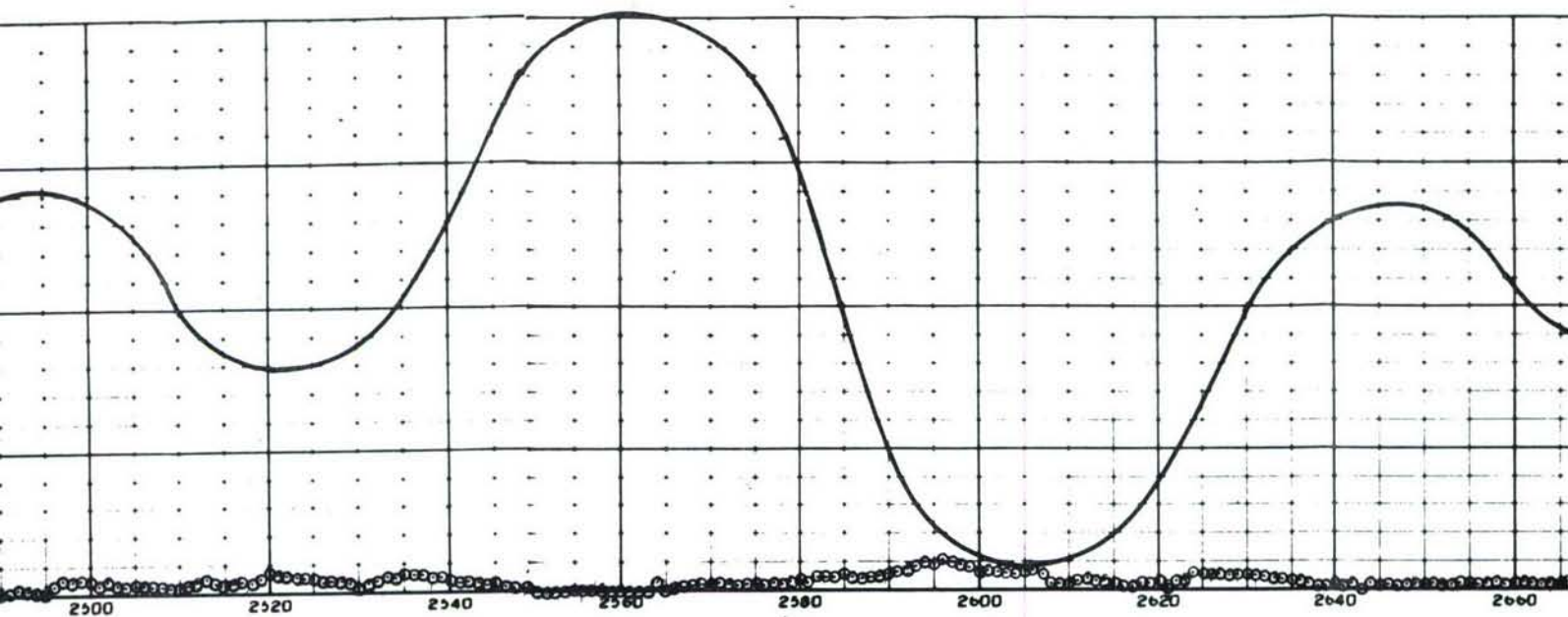
SITE 3B. SCATTER PLOT 500 FOOT DEPTH  
 (3460 FEET ABOVE BOTTOM) OCTOBER—DECEMBER 1966

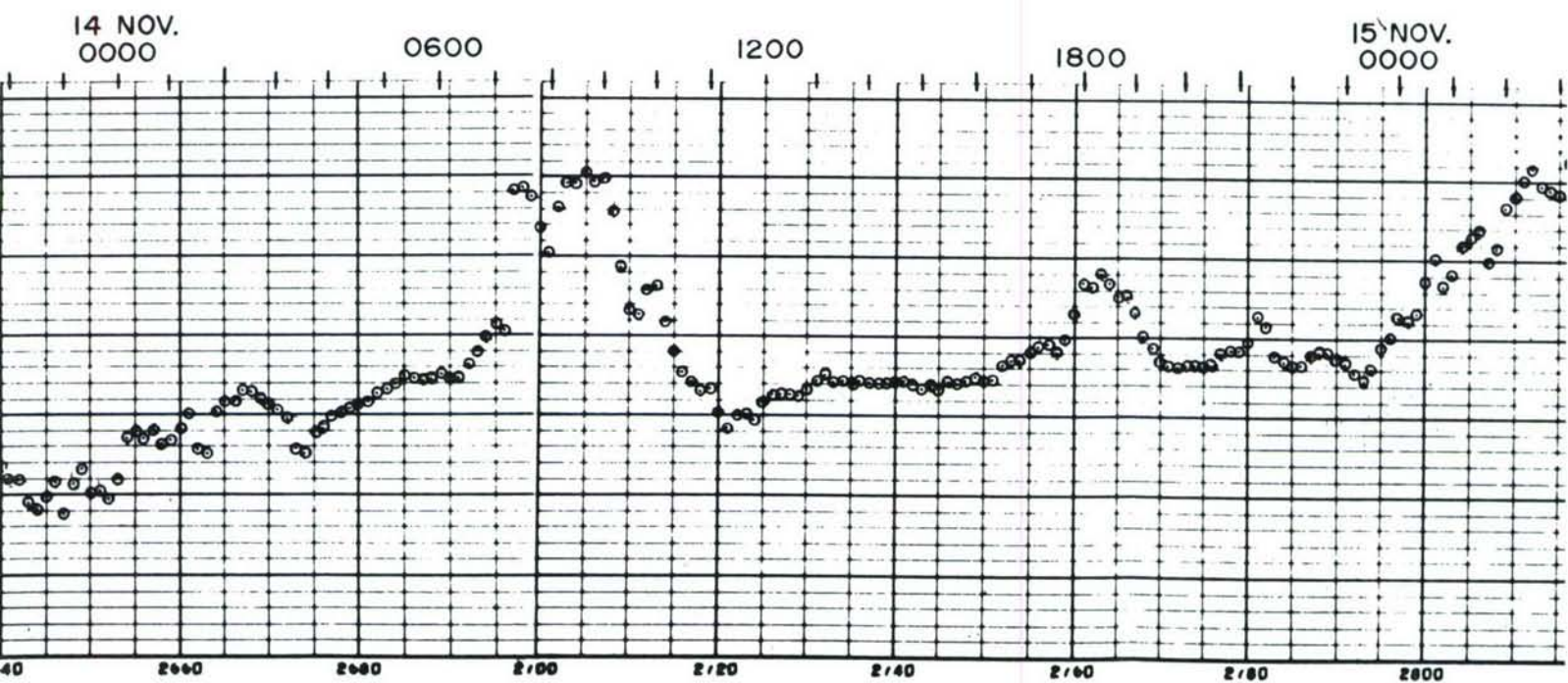
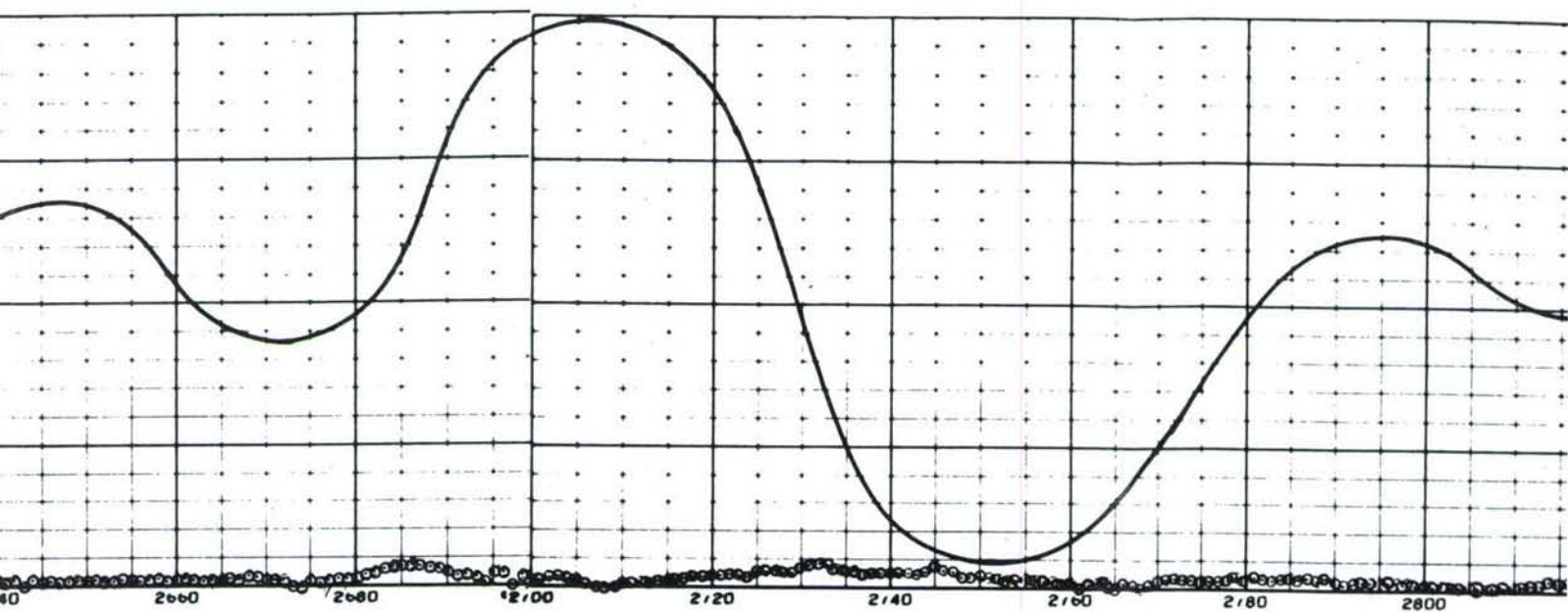
TITLE: <b>FILM PROCESSING AND READING LOG*</b>		410118
<b>FILM IDENTIFICATION BY CUSTOMER</b> Date <u>9 January 1967</u>		Geodyne Assigned Film No.
Name <u><del>NAME</del> <del>XXXXXXXXXX</del> Thomas G. Long</u> Address <u>Naval Oceanographic Office</u> <u>Washington D.C. 20390</u>		399-3B
Customer's film identification		
Type of Instrument <u>A-100 Current Meter</u> and Serial No. <u>399</u> Motor RPM _____, Film Advance Speed <u>120 in/sec.</u> , No. Timer Cam Lobes <u>6</u> <input type="checkbox"/> Continuous or, <input checked="" type="checkbox"/> Interval Record,      Time Interval Between Records <u>5 sec.</u>		
Cruise <u>056610</u> , Location: Lat. <u>33° 04.3'N</u> Long. <u>118° 29.8'W</u> Meter Depth <u>2205 feet</u> Magnetic variation (+ = East, - = West) <u>14° 26' East</u>		
Recording started at <u>1350</u> Hours, <u>plus 8</u> Time Zone, <u>25 Oct 1966</u> Date Recording ended at <u>1930</u> Hours, <u>plus 8</u> Time Zone, <u>4 Dec 1966</u> Date		
Comments: Station 3 Brav0, Water depth 3960 feet		
<b>INSTRUCTIONS TO GEODYNE</b>		
<input type="checkbox"/> Process original film, <input type="checkbox"/> 100', <input type="checkbox"/> 150' <input type="checkbox"/> Print for hand reading (clear edge) <input type="checkbox"/> Print for automatic " (dark edge) <input checked="" type="checkbox"/> Analog strip chart record <input checked="" type="checkbox"/> Magnetic tape record		Store at Geodyne or send to: <u>Naval Oceanographic Office</u> <u>Washington D.C. 20390</u> <u>Attn: Ronald Kopenski, Code 9100</u>
Other instructions: 1. Process only that data between the tape strips on the film. 2. Supply plots of direction versus time and speed versus time. 3. Supply scatter plots and histogram plots.		Customer's Order No. <u>(3)</u>
<b>FILM AND READING EVALUATION BY GEODYNE</b>		
Record started: foot mark <u>68264/16</u> @ _____ hours, _____ Date Record ended: foot mark <u>68574/16</u> @ _____ hours, _____ Date Total footage <u>31'40"</u> , Total elapsed time of record _____		
FILM EVALUATION: Alignment _____, Density _____ Compass _____, Vane _____, Rotor _____, Time pulse _____ Comments:		
Strip Chart:		
Magnetic Tape: <u>000 519 Part 8</u>		
Date Completed: Film Processing _____, Reading <u>3-14-67</u>		

SITE 3B. DATA SHEET—2205 FOOT DEPTH (1755 FEET ABOVE  
BOTTOM) OCTOBER—DECEMBER 1966



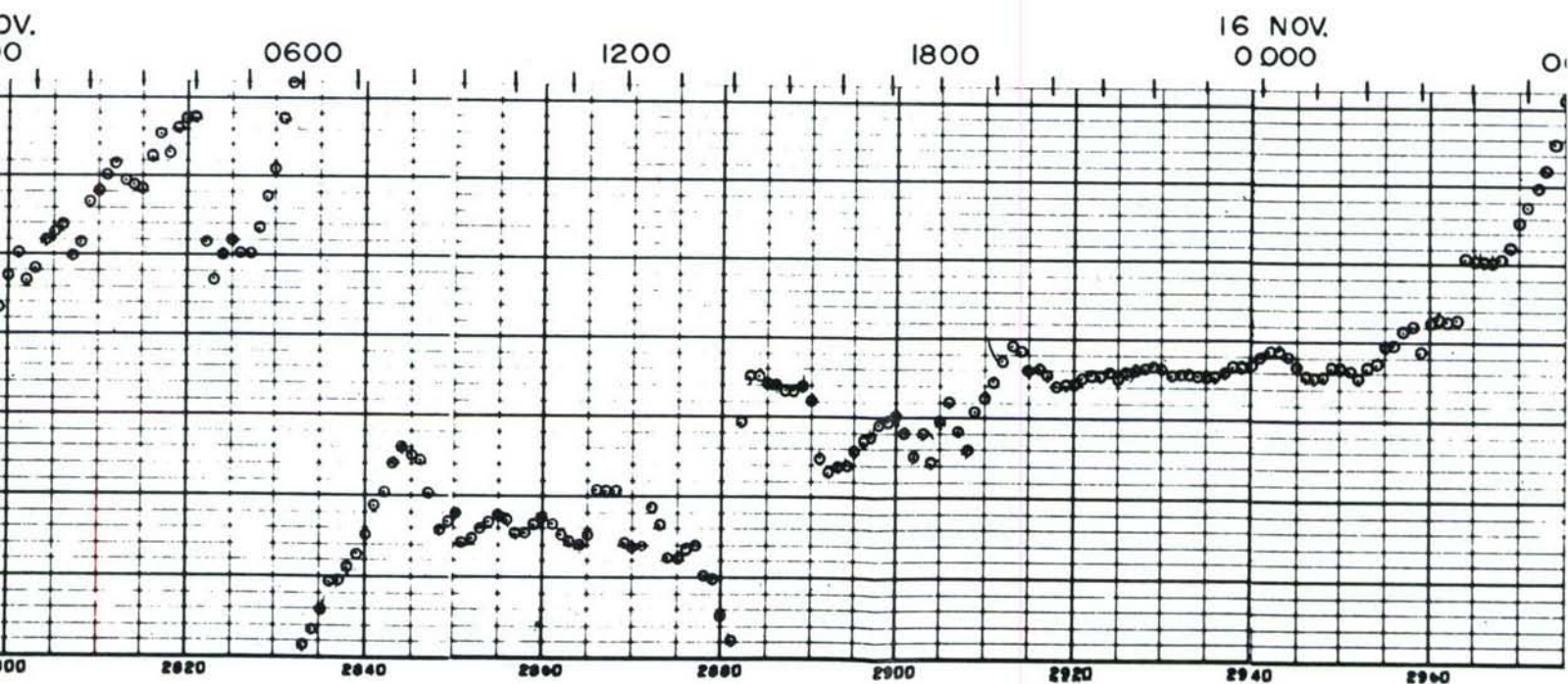
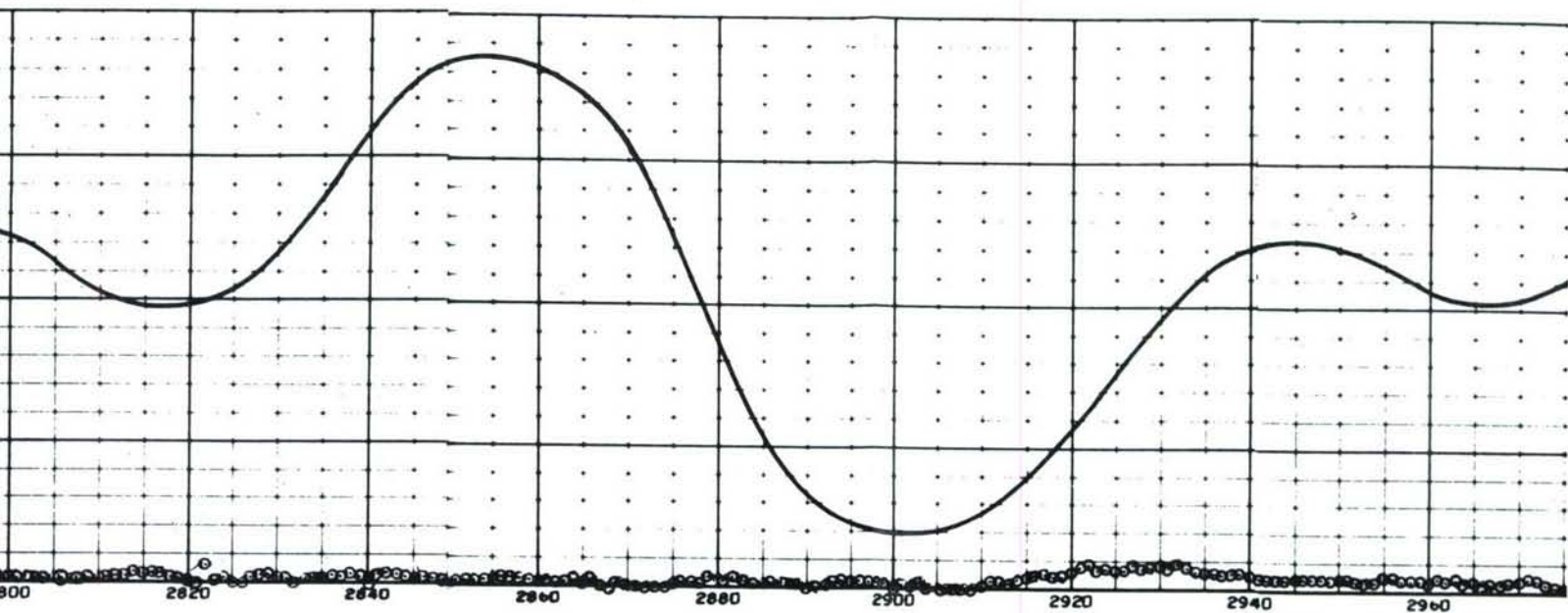






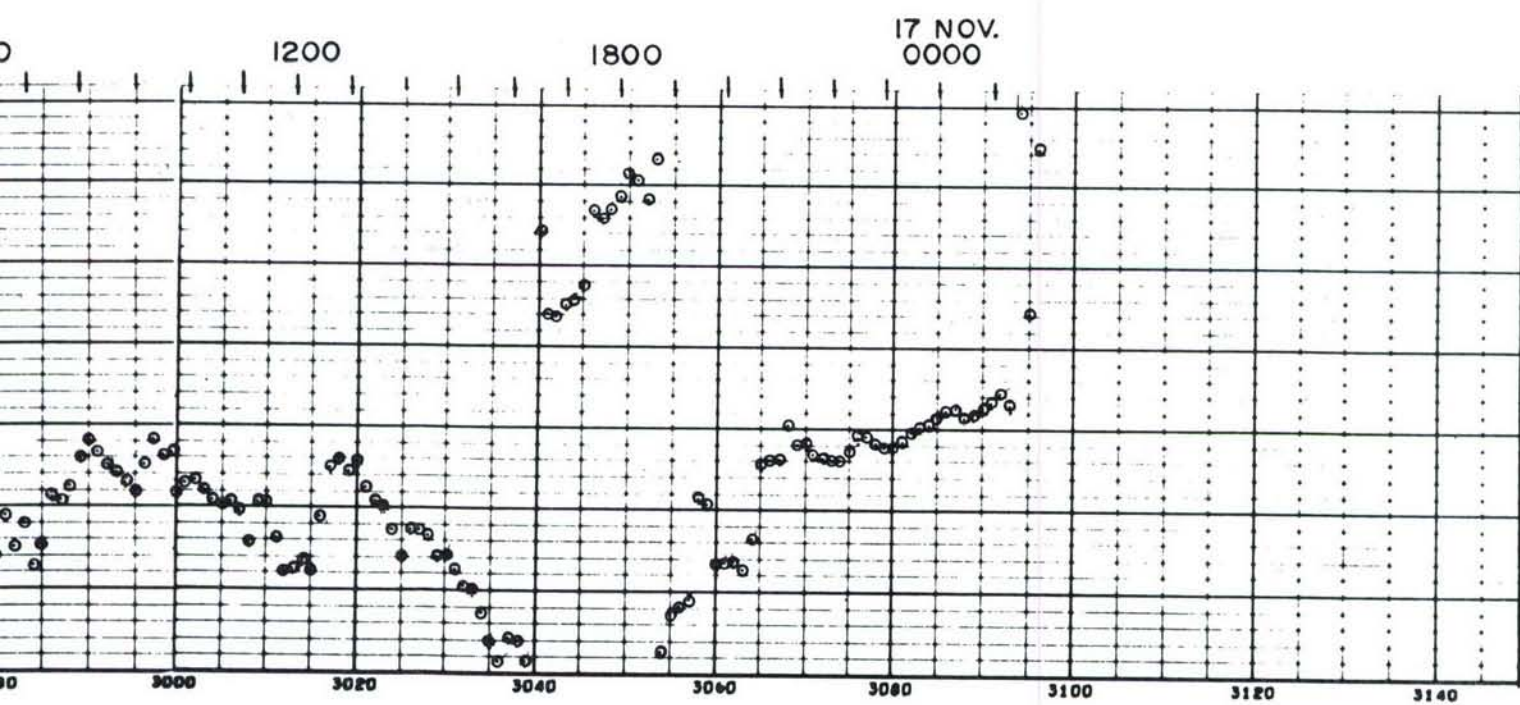
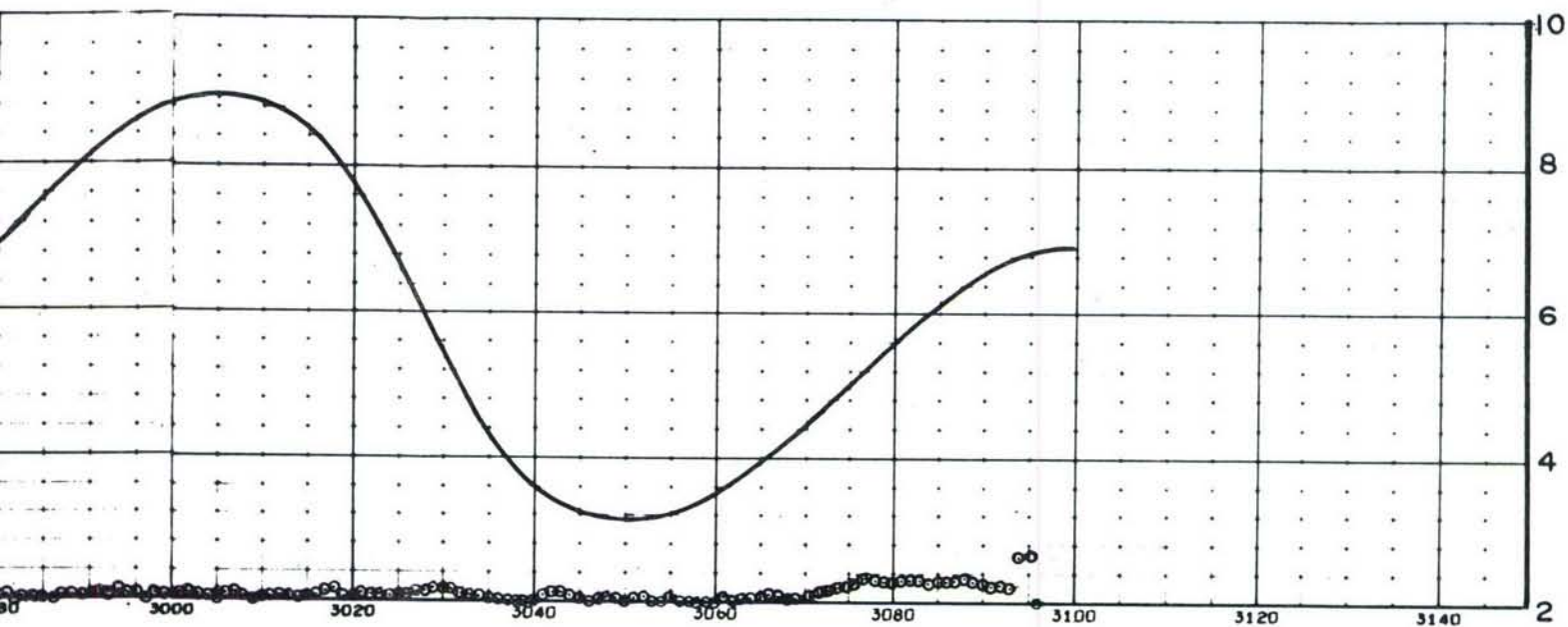
SITE 3B. CURRENT METER RECORD AND TIDE HEIGHT—5 DAY RECORD—2205 FOOT DEPTH (1755 FEET ABOVE I

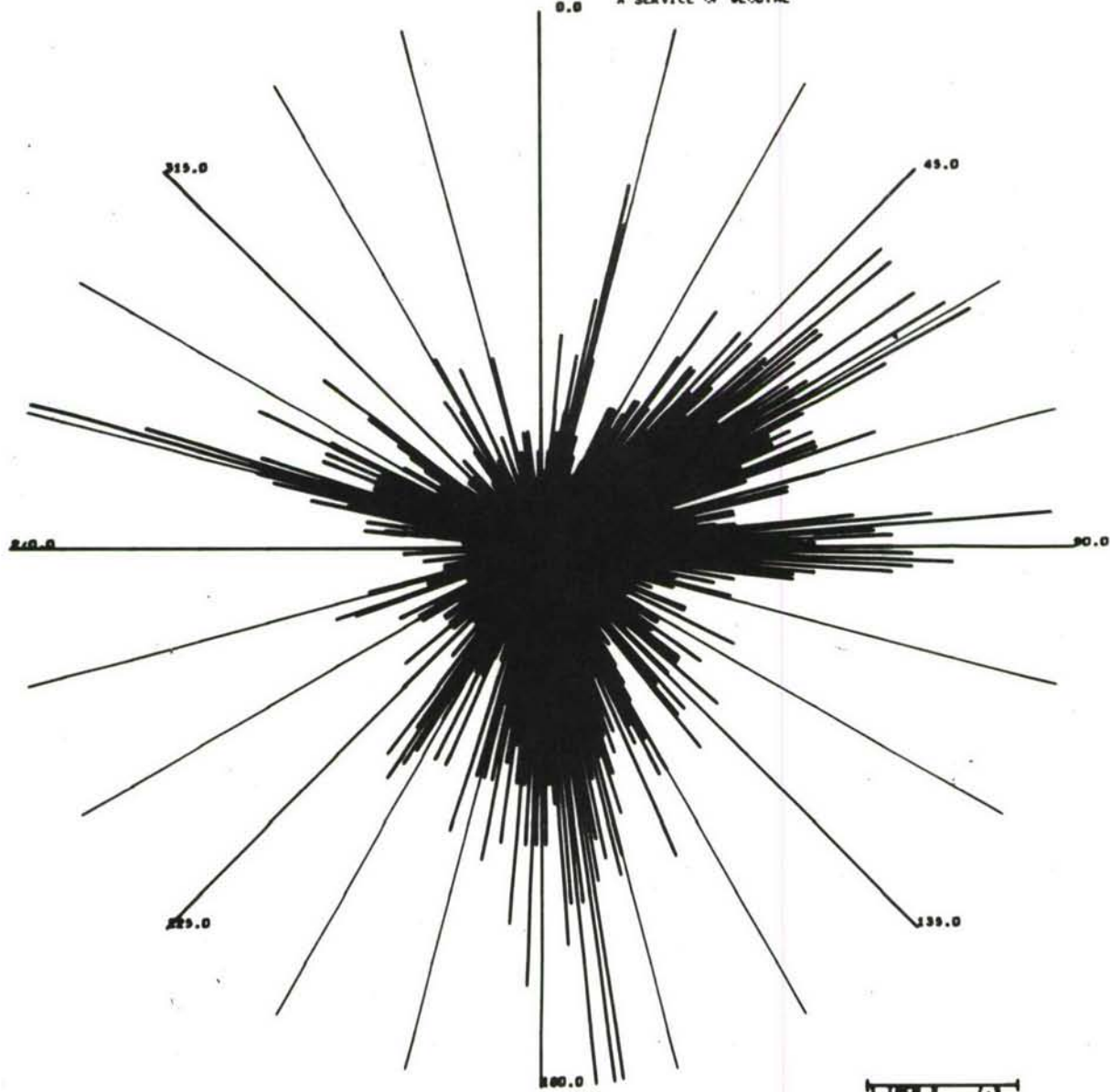




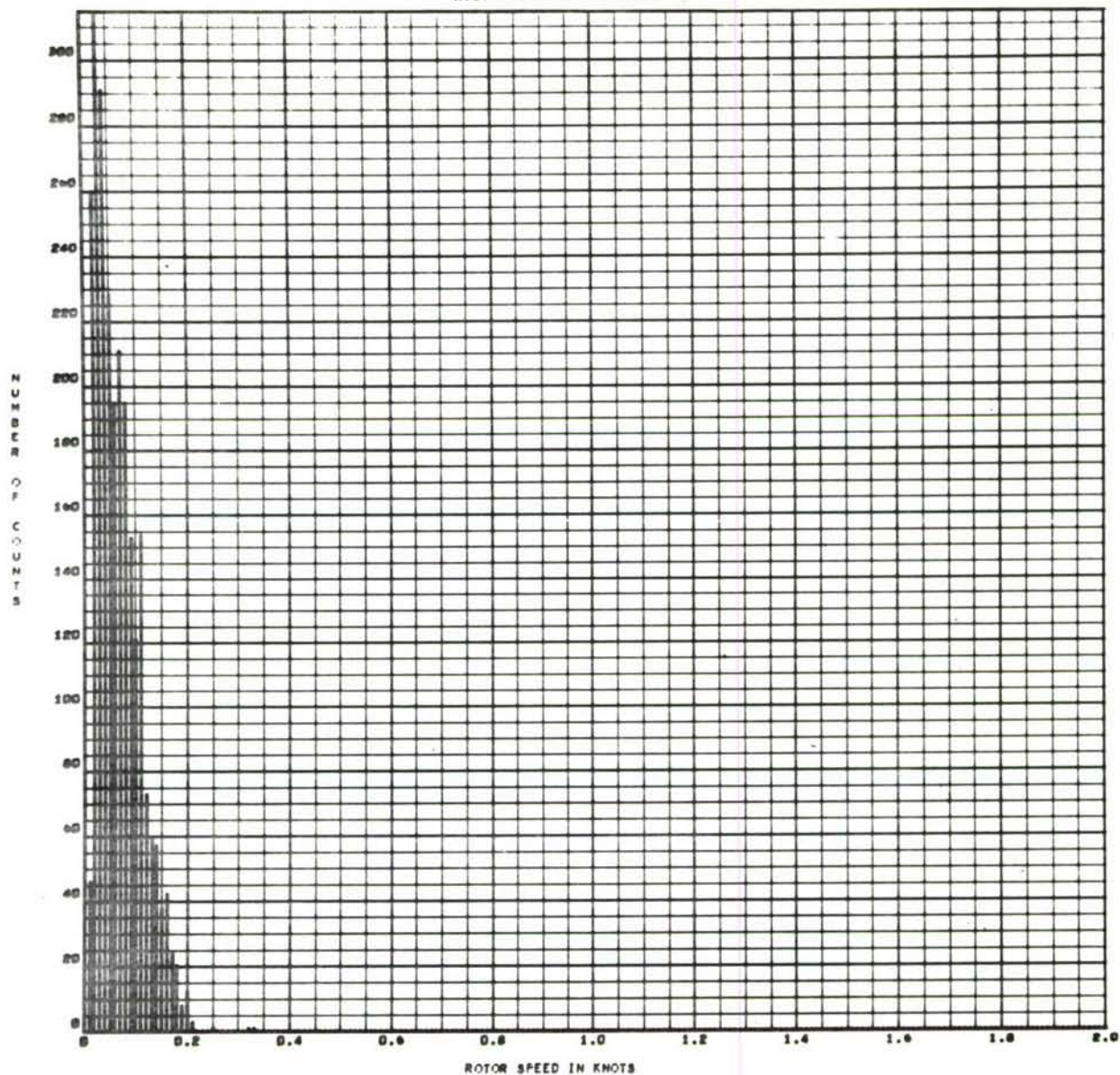
FEET ABOVE BOTTOM)





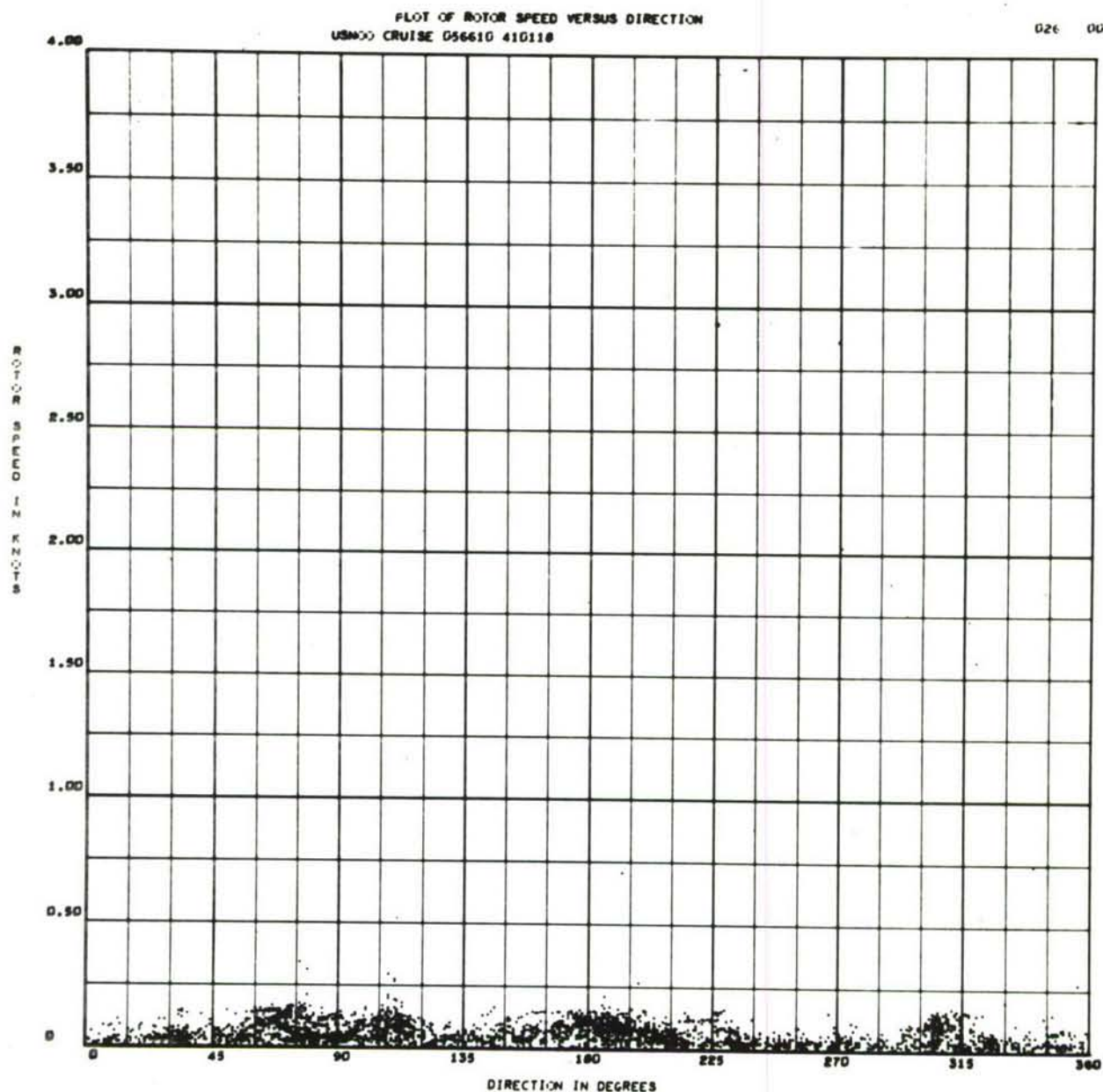


SITE 3B. POLAR COORDINATE HISTOGRAM 2205 FOOT DEPTH  
(1755 FEET ABOVE BOTTOM) OCTOBER—DECEMBER 1966



SITE 3B. HISTOGRAM OF ROTOR SPEED 2205 FOOT DEPTH  
(1755 FEET ABOVE BOTTOM) OCTOBER—DECEMBER 1966





SITE 3B. SCATTER PLOT 2205 FOOT DEPTH  
(1755 FEET ABOVE BOTTOM) OCTOBER—DECEMBER 1966

TITLE: FILM PROCESSING AND READING LOG\*

410116

FILM IDENTIFICATION BY CUSTOMER

Date 9 January 1967 Geodyne Assigned Film No. 451-5C

Name XXXXXXXXXXXX Thomas G. Long

Address Naval Oceanographic Office  
Washington D.C. 20390

Customer's film identification

Type of Instrument A-100 Current Meter and Serial No. 451  
Motor RPM \_\_\_\_\_, Film Advance Speed \_\_\_\_\_, No. Timer Cam Lobes 6  
☐ Continuous or, ☒ Interval Record, Time Interval Between Records 5 Seconds

Cruise 056610, Location: Lat. 32° 58.8'N Long. 118° 28.8'W Meter Depth 13 feet  
Magnetic variation (+ = East, - = West) 14° 26' East above bottom  
Recording started at 0954 Hours, plus 8 Time Zone, 22 Oct. 1966 Date  
Recording ended at 1459 Hours, plus 8 Time Zone, 19 Nov. 1966 Date  
Comments:

Station 5 C, Water depth 3750 feet

INSTRUCTIONS TO GEODYNE

Store at Geodyne or send to:

- ☐ Process original film, ☐ 100', ☐ 150'  
☐ Print for hand reading (clear edge)  
☐ Print for automatic " (dark edge)

Naval Oceanographic Office.  
Washington D.C. 20390  
Attn: Ronald Kopenski, Code 9100

- ☒ Analog strip chart record  
☒ Magnetic tape record

Other instructions:

1. Process only that data between the \_\_\_\_\_ tape strips on the film.  
2. Supply plots of direction versus time and speed versus time.  
3. Supply scatter plots and histogram plots.

Customer's Order No. \_\_\_\_\_

FILM AND READING EVALUATION BY GEODYNE

Record started: foot mark 6233 + 16 @ \_\_\_\_\_ hours, \_\_\_\_\_ Date  
Record ended: foot mark 6765 + 4 @ \_\_\_\_\_ hours, \_\_\_\_\_ Date  
Total footage 31' + 28', Total elapsed time of record \_\_\_\_\_

FILM EVALUATION: Alignment \_\_\_\_\_, Density \_\_\_\_\_

Compass \_\_\_\_\_, Vane \_\_\_\_\_, Rotor \_\_\_\_\_, Time pulse \_\_\_\_\_

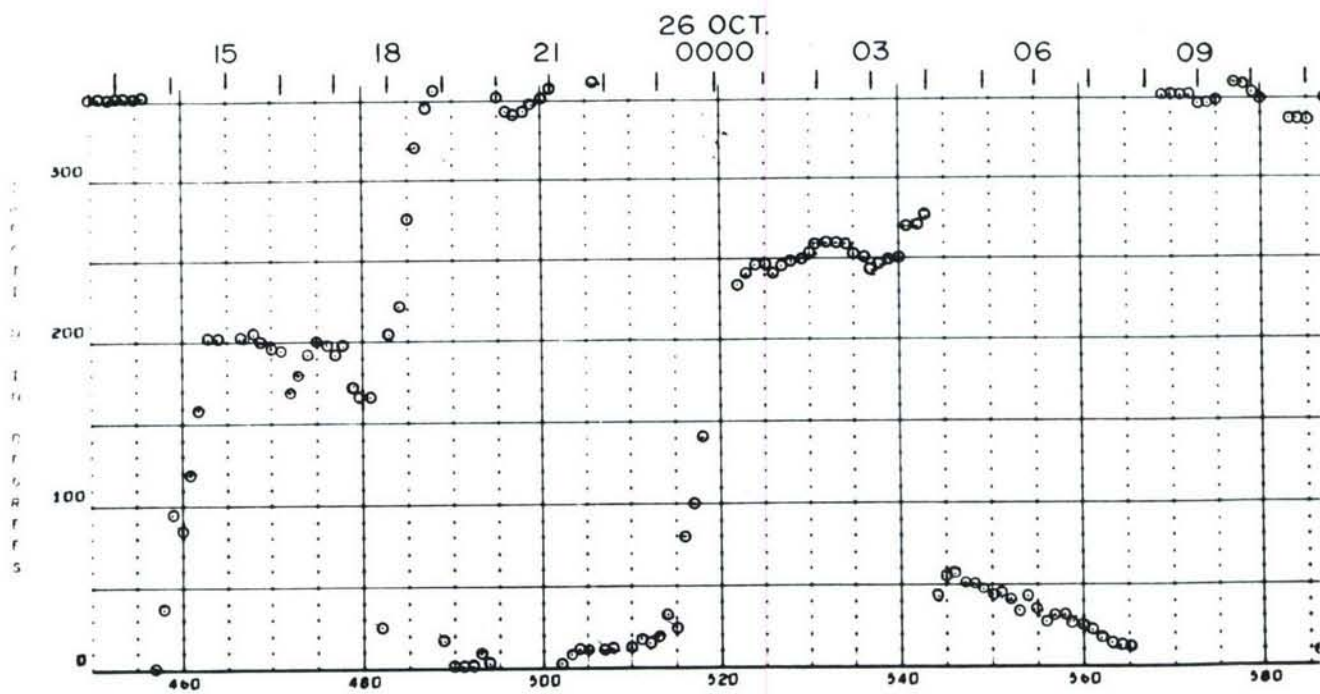
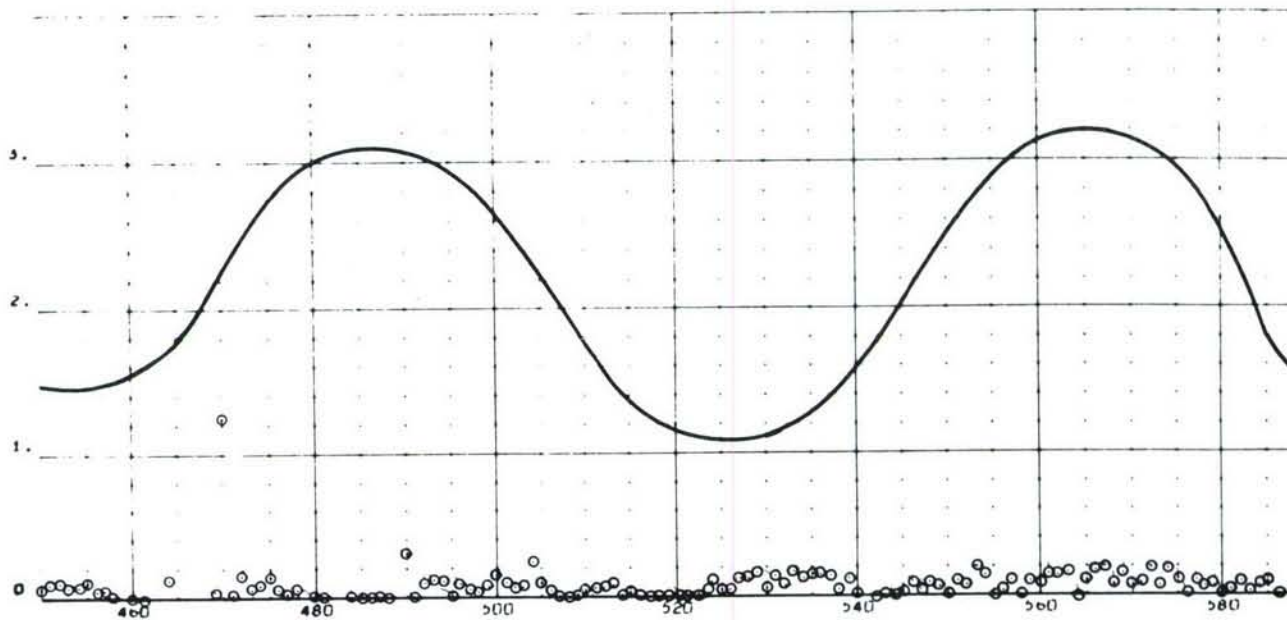
Comments: Continuous, Rotor Pulses very bright. Speed recorded on magnetic tape probably not correct.

Strip Chart:

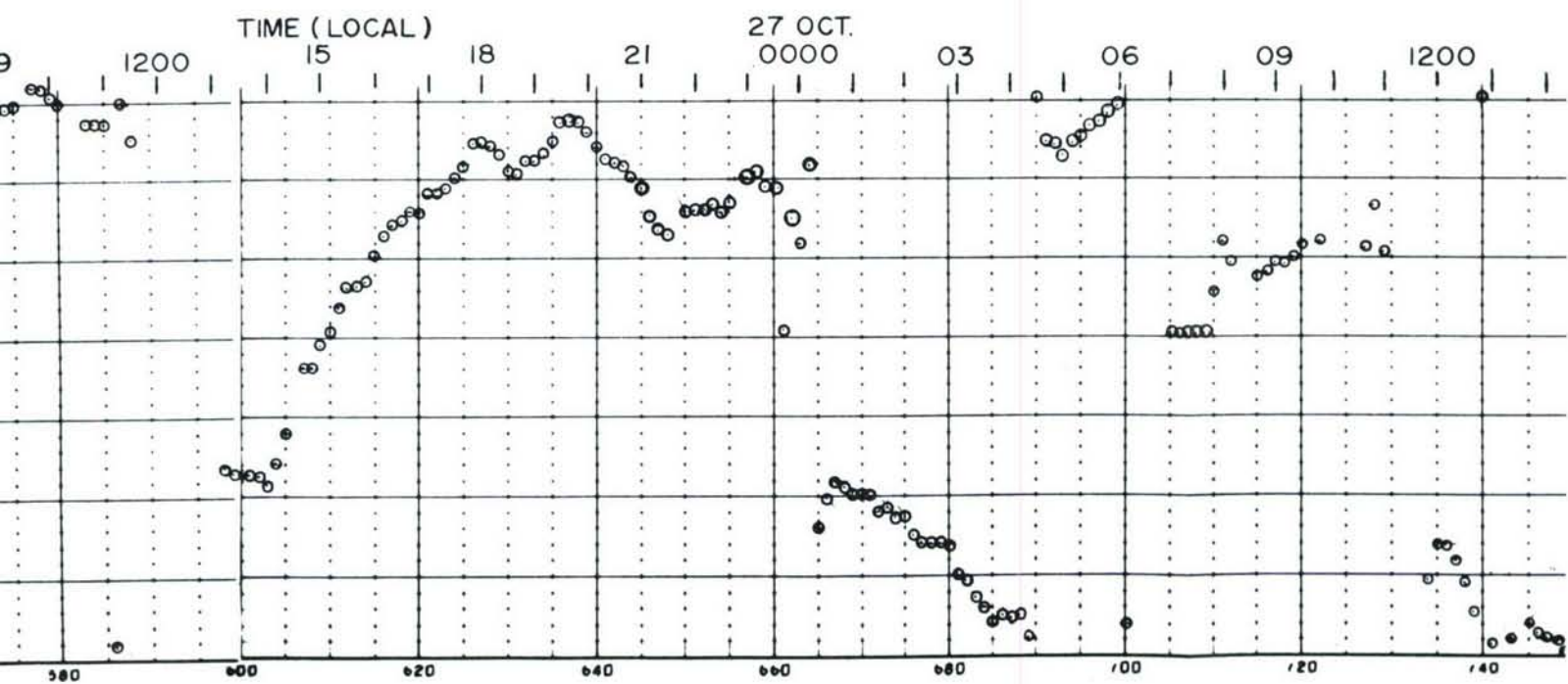
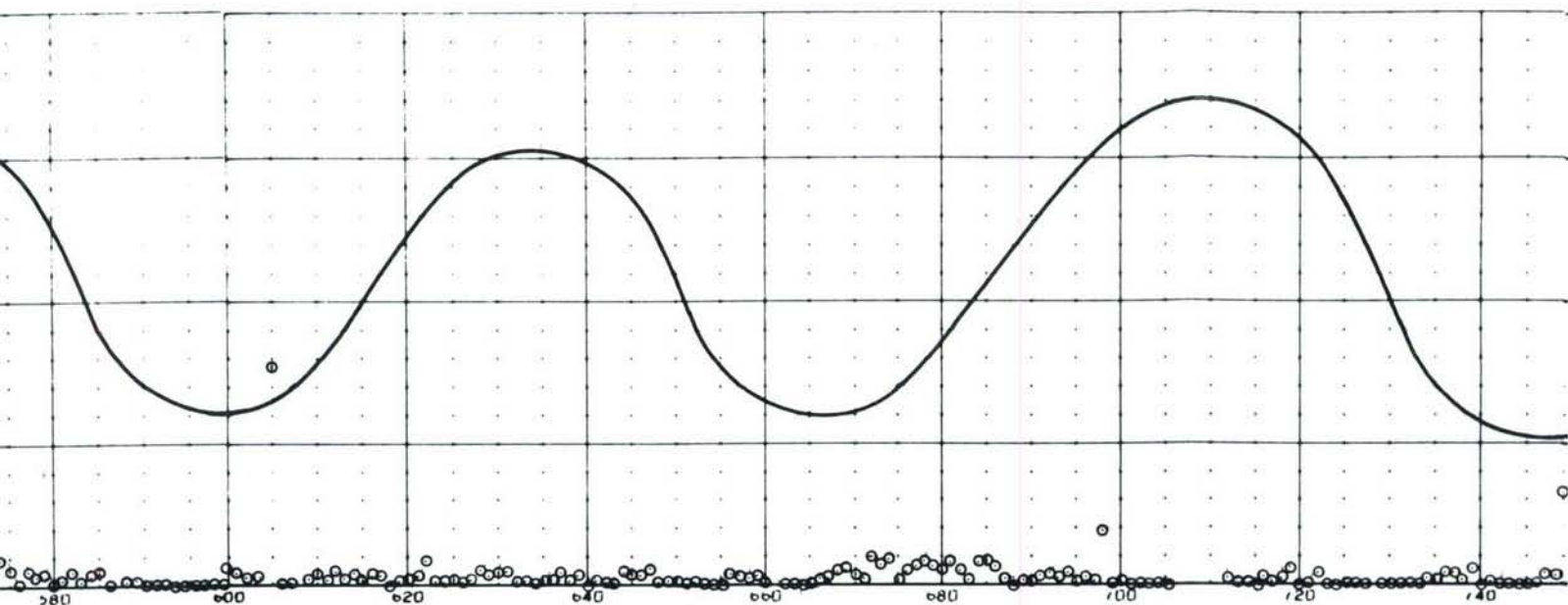
Magnetic Tape: 000 519 Part 6

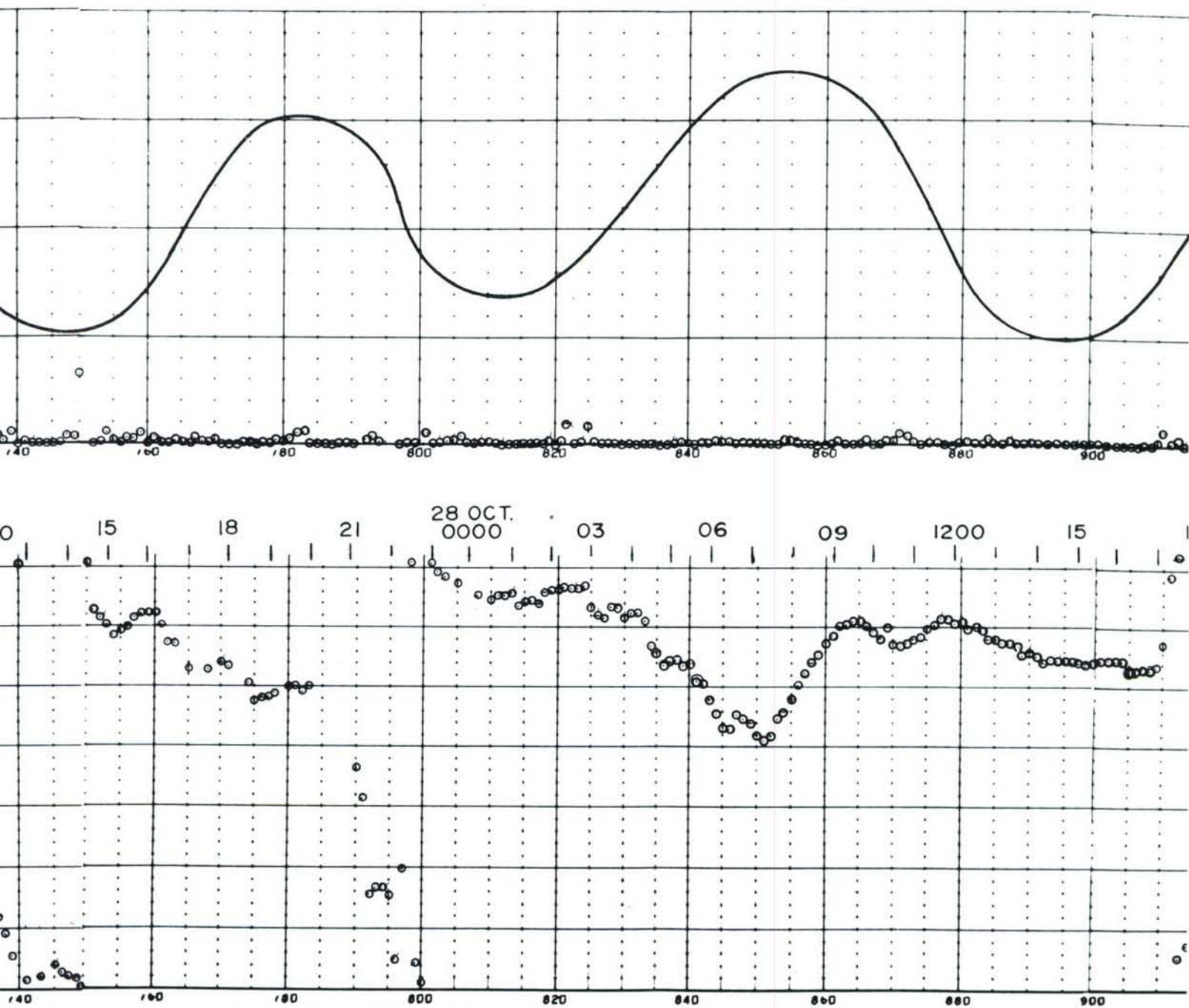
Date Completed: Film Processing \_\_\_\_\_, Reading 3-14-67

SITE 5C. DATA SHEET—3737 FOOT DEPTH (13 FEET ABOVE  
BOTTOM) OCTOBER—NOVEMBER 1966

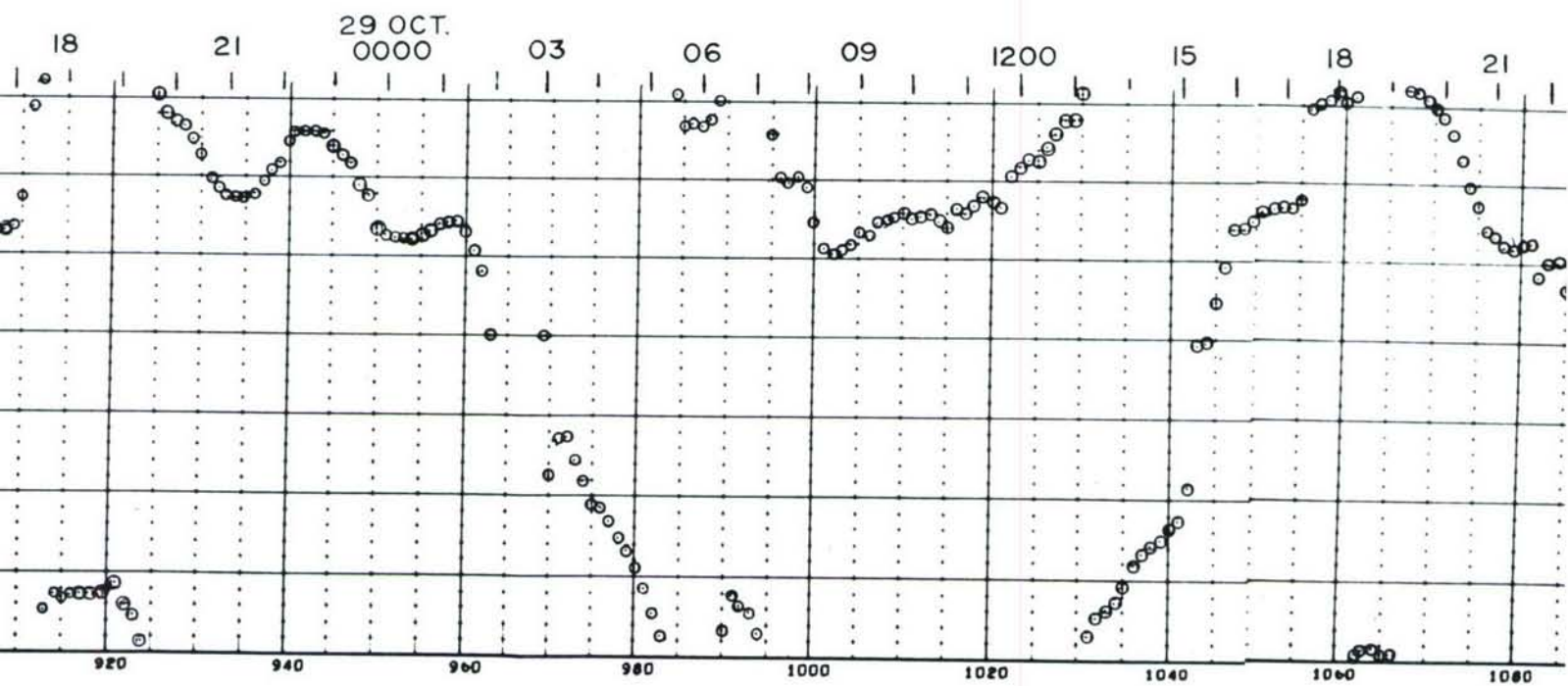
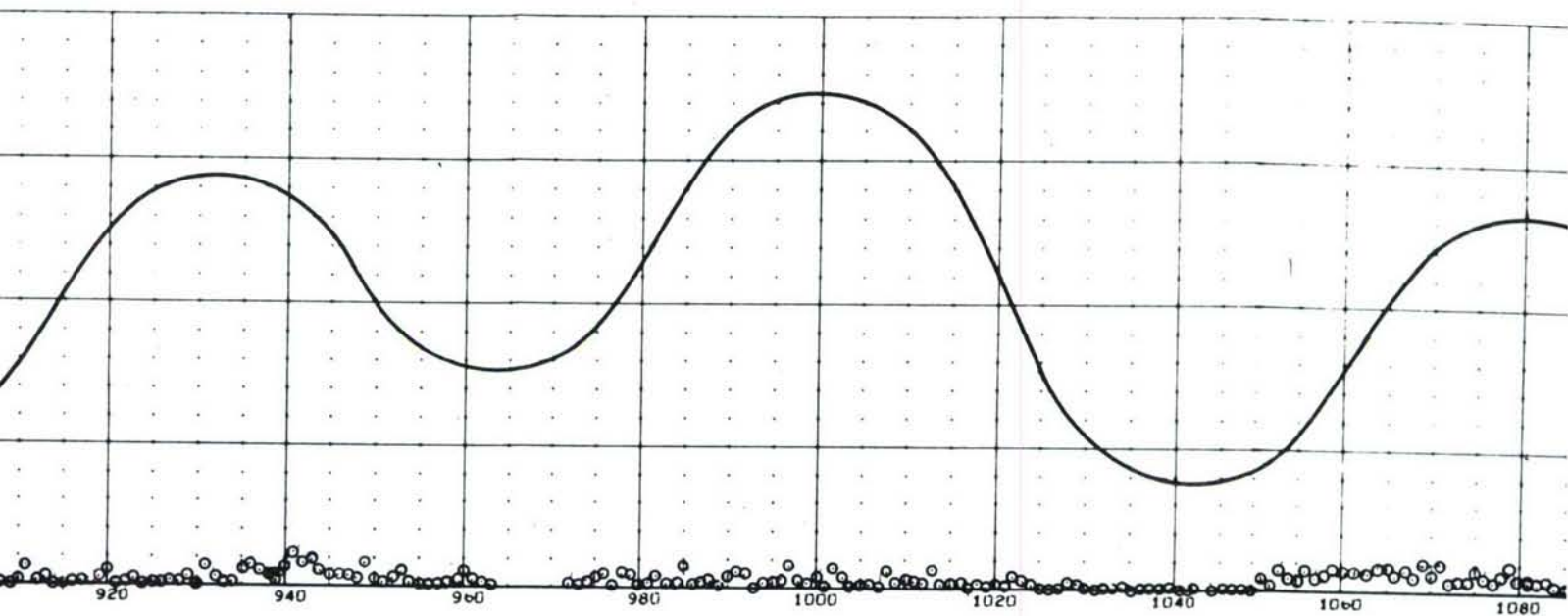




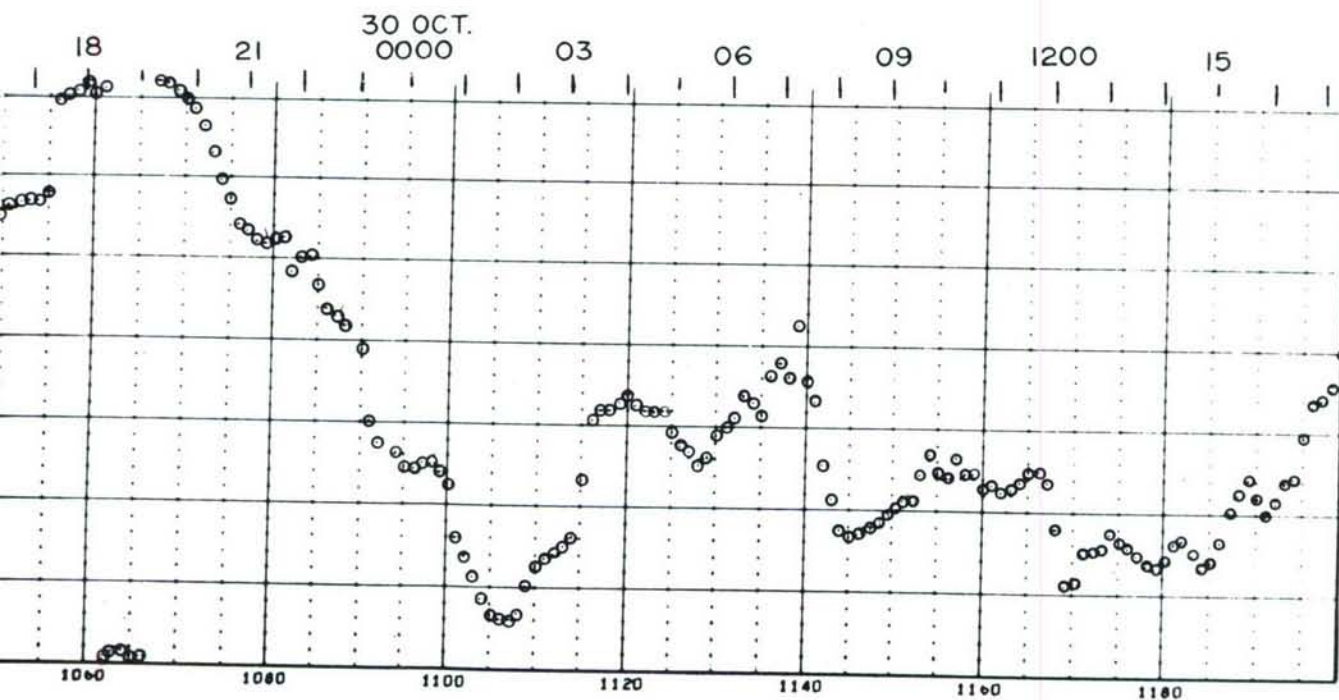
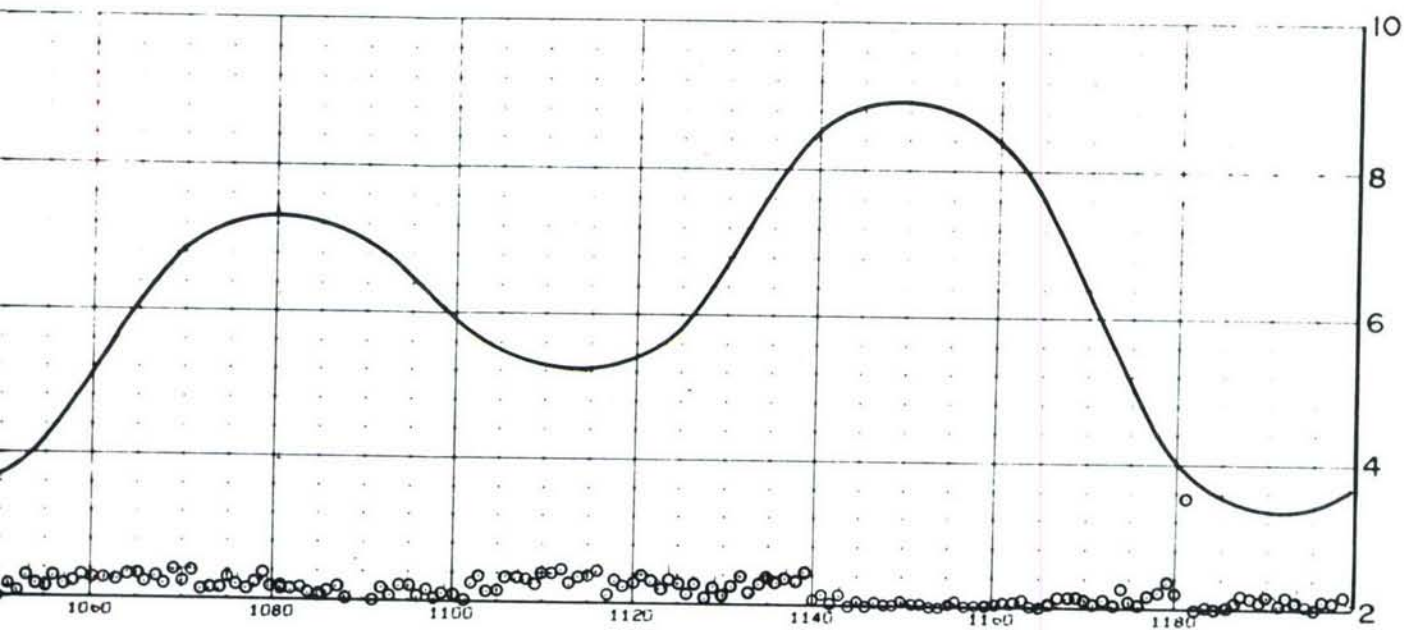


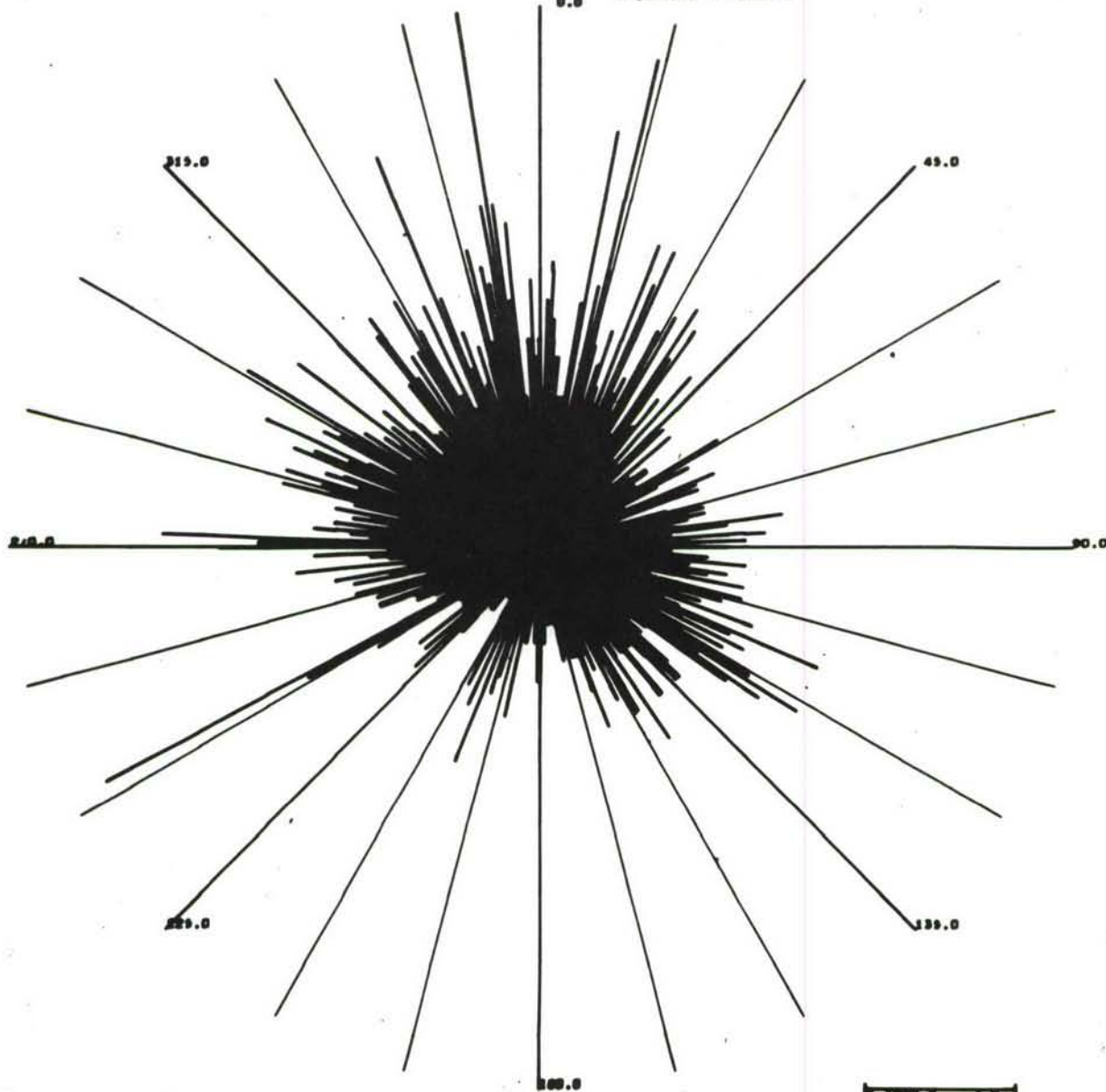


SITE 5C. CURRENT METER RECORD AND TIDE HEIGHT—5 DAY RECORD—3737 FOOT DEPTH (13 FEET ABOVE BOTTOM)

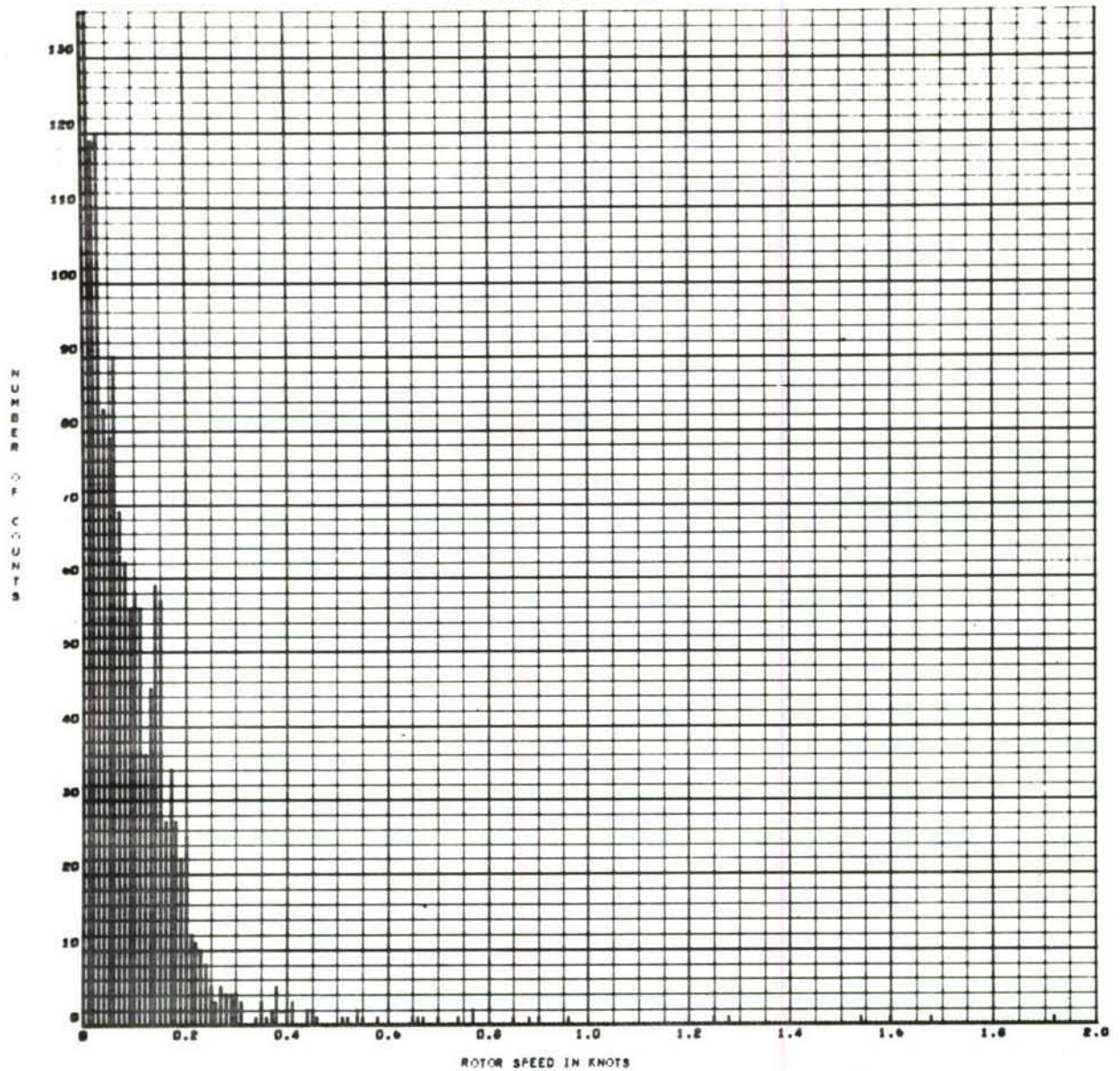






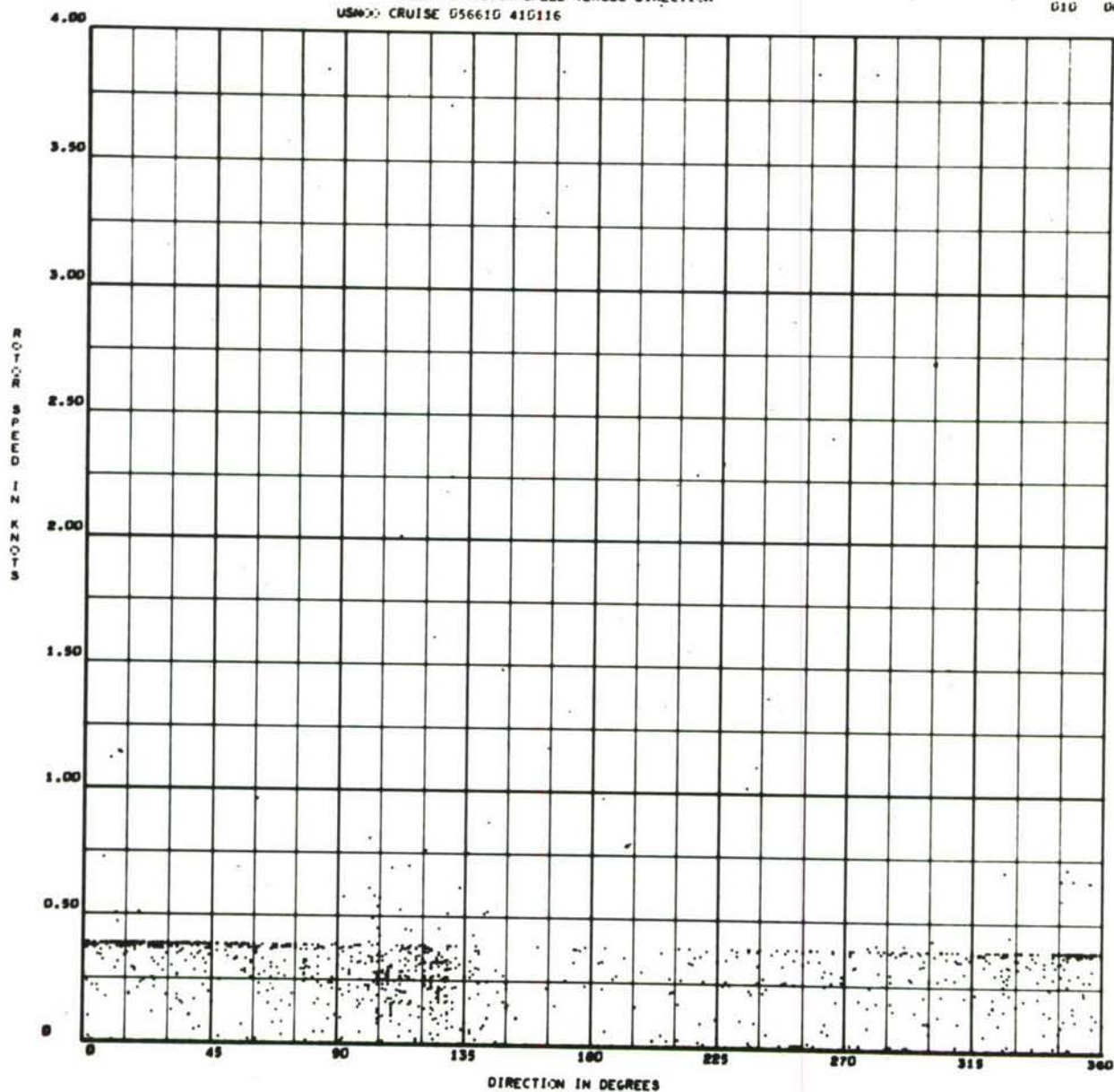


SITE 5C. POLAR COORDINATE HISTOGRAM 3737 FOOT DEPTH  
(13 FEET ABOVE BOTTOM) OCTOBER—NOVEMBER 1966



SITE 5C. HISTOGRAM OF ROTOR SPEED 3737 FOOT DEPTH  
(13 FEET ABOVE BOTTOM) OCTOBER—NOVEMBER 1966

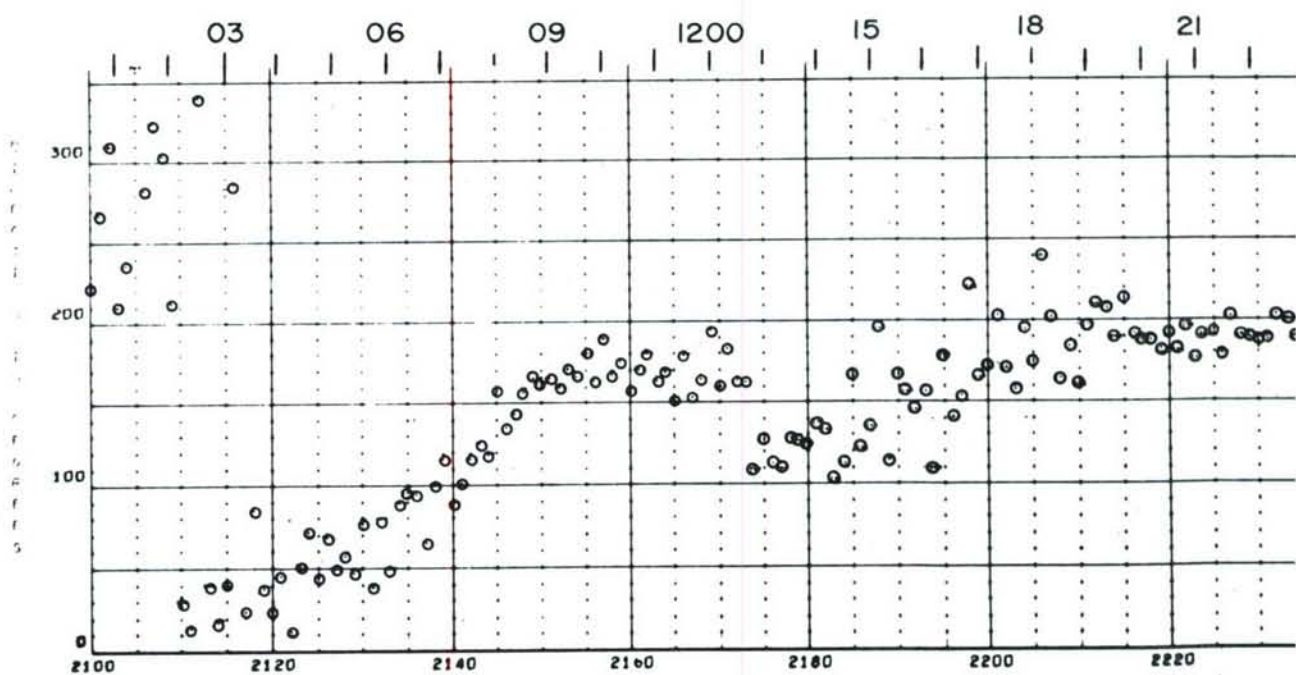
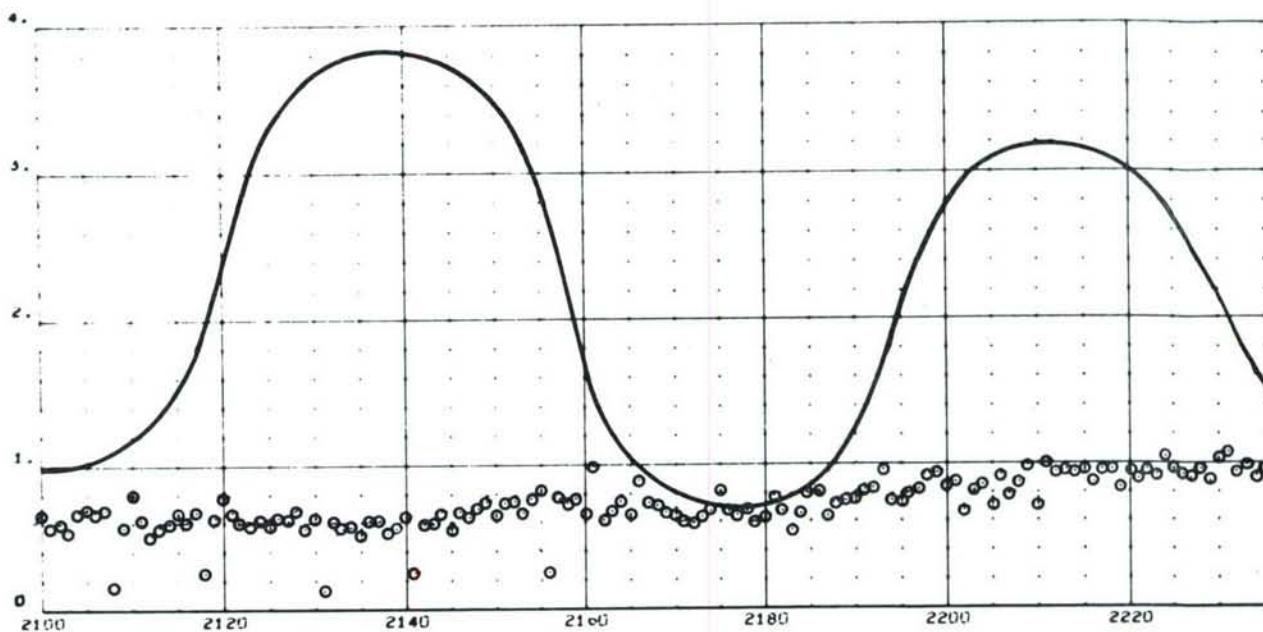




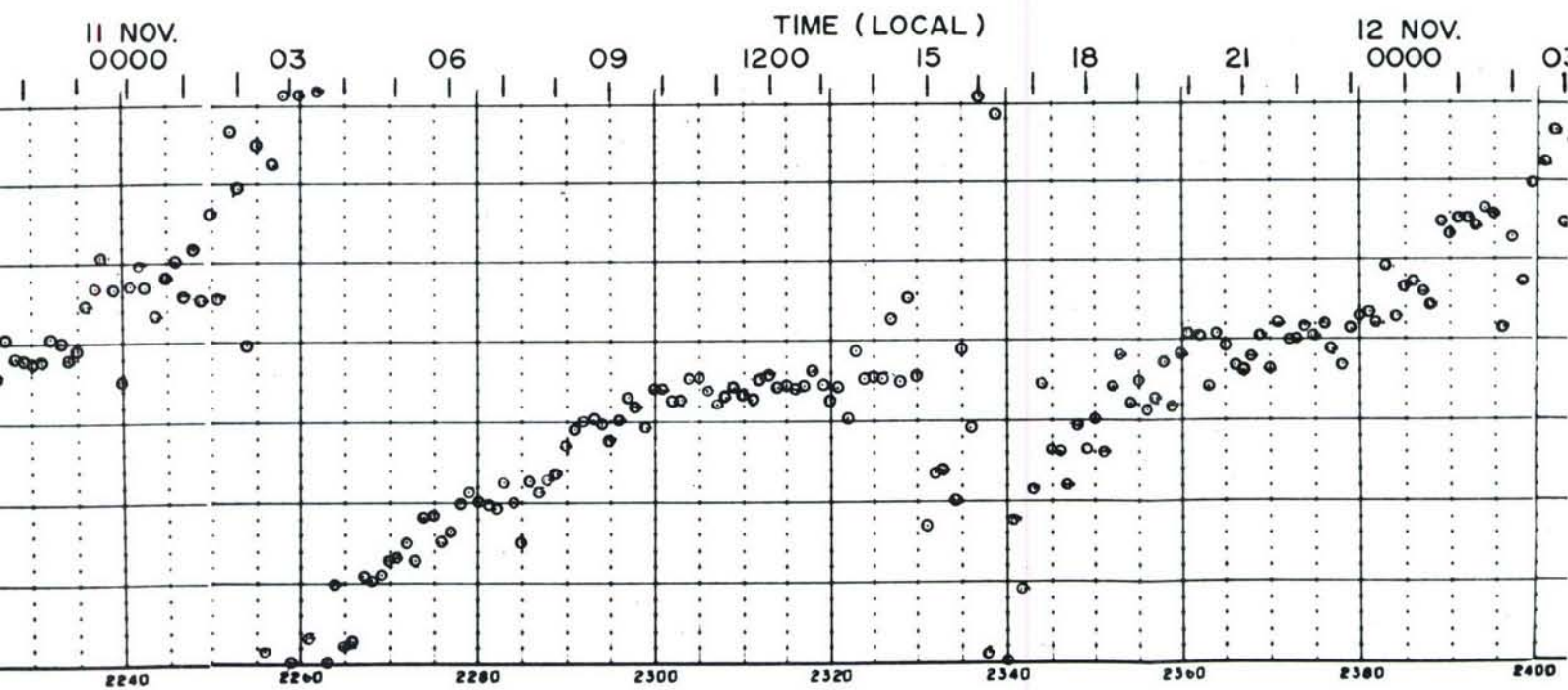
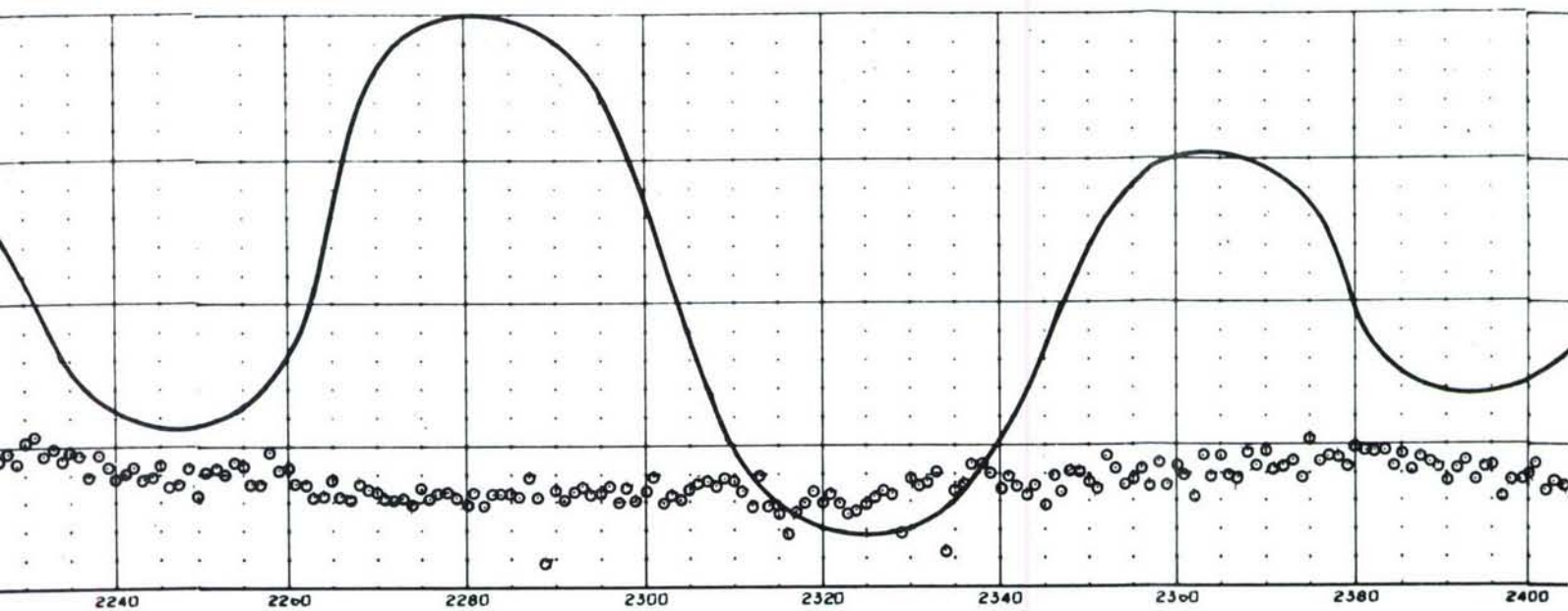
SITE 5C. SCATTER PLOT 3737 FOOT DEPTH  
(13 FEET ABOVE BOTTOM) OCTOBER—NOVEMBER 1966

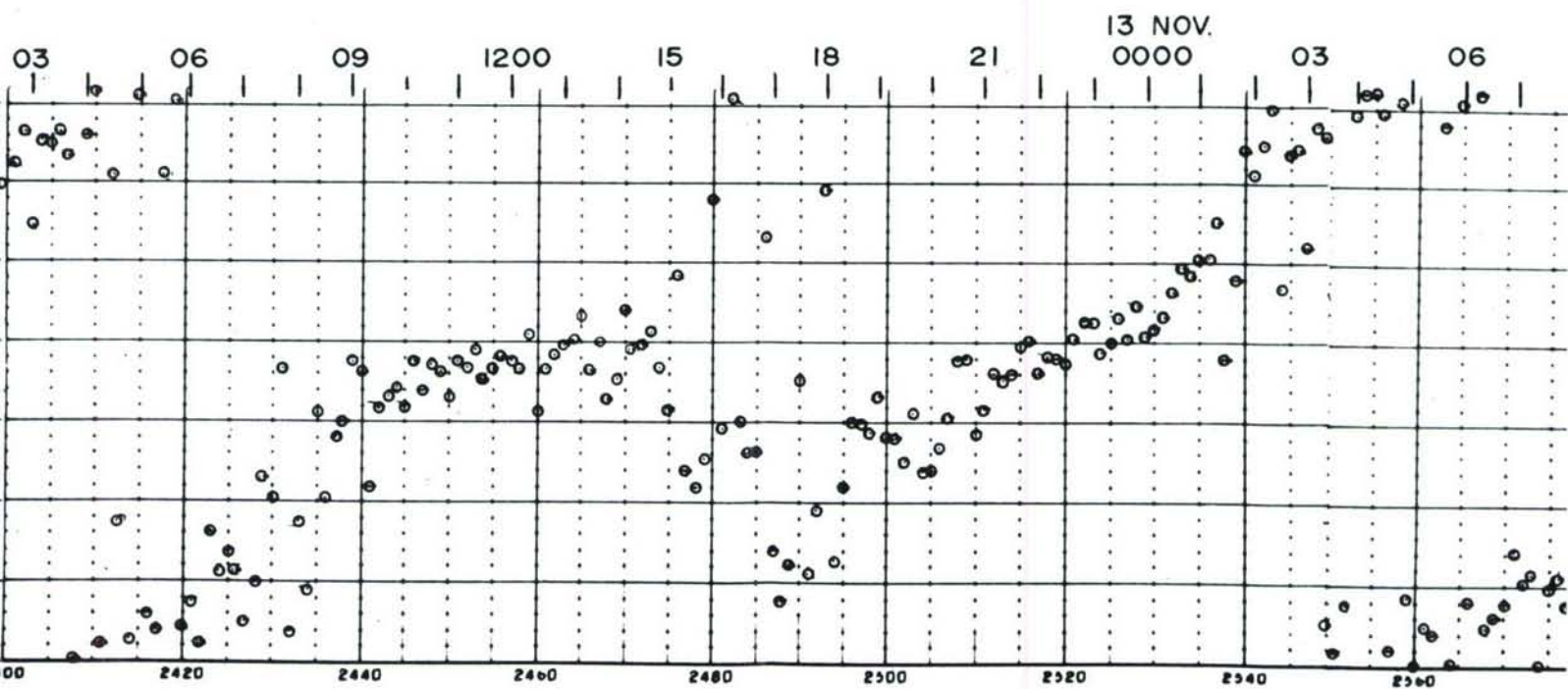
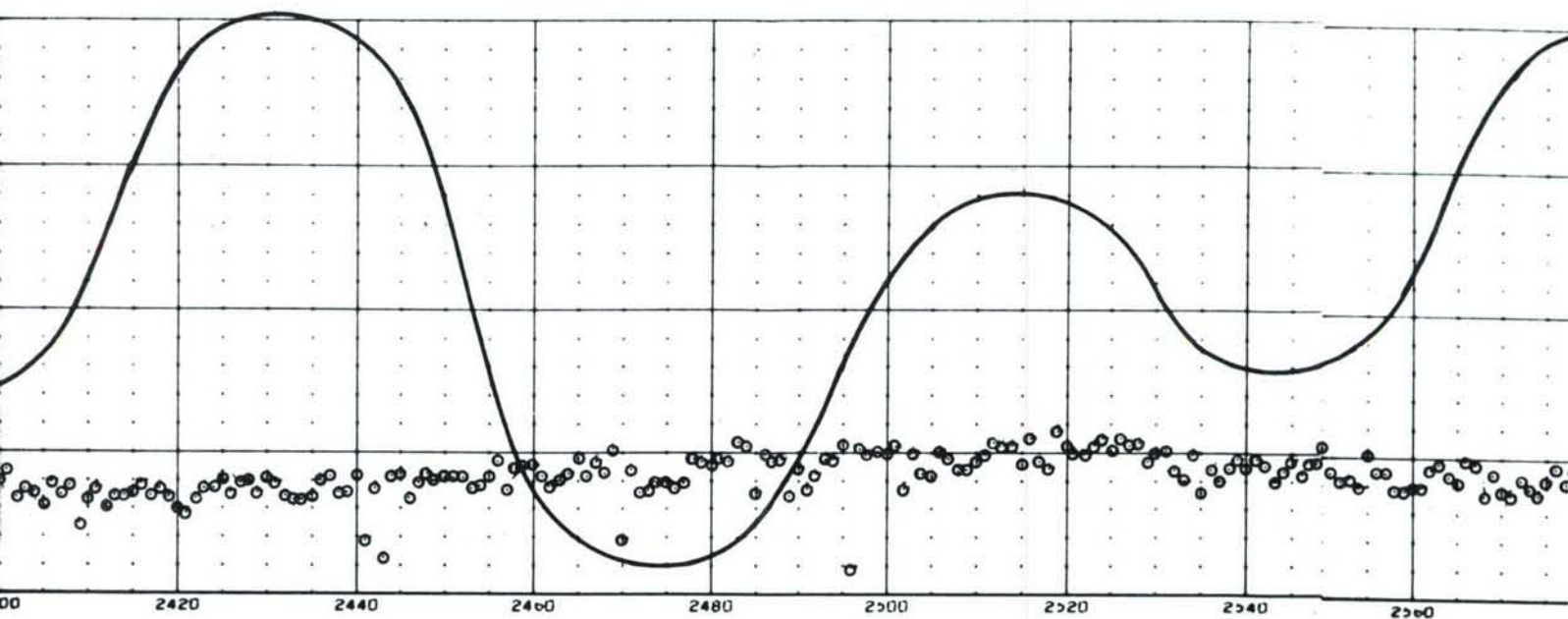
TITLE: <b>FILM PROCESSING AND READING LOG*</b>		416114
<b>FILM IDENTIFICATION BY CUSTOMER</b>		Geodyne Assigned Film No.
Name <del>XXXXXXXXXXXX</del> Thomas G. Long	Date 9 Jan 1967	
Address Naval Oceanographic Office		
Washington D.C.		245-7C
Type of Instrument A-100 Current Meter	Customer's film identification	
Motor RPM _____, Film Advance Speed _____	and Serial No. 245	
<input type="checkbox"/> Continuous or, <input checked="" type="checkbox"/> Interval Record,	No. Timer Cam Lobes 6	
Time Interval Between Records 5 Seconds		
Cruise 056610, Location: Lat. 32° 56.7'N	Long. 118° 19.75'W	Meter Depth 536 feet
Magnetic variation (+ = East, - = West) 14° 26' East		
Recording started at 1035 Hours,	plus 8	Time Zone, 26 Oct 1966 Date
Recording ended at 1425 Hours,	plus 8	Time Zone, 23 Nov 1966 Date
Comments: Station 7C, Water depth 4080 feet		
<b>INSTRUCTIONS TO GEODYNE</b>		
		Store at Geodyne or send to:
<input type="checkbox"/> Process original film, <input type="checkbox"/> 100', <input type="checkbox"/> 150'	Naval Oceanographic Office	
<input type="checkbox"/> Print for hand reading (clear edge)	Washington D.C. 20390	
<input type="checkbox"/> Print for automatic " (dark edge)	Attn: Ronald Kopenski, Code 9100	
<input checked="" type="checkbox"/> Analog strip chart record		
<input checked="" type="checkbox"/> Magnetic tape record		
Other instructions:		
1. Process only that data between tape strips on film.		
2. Supply scatter plots and histogram plots.		
3. Supply plots of direction versus time and speed versus time.		
Customer's Order No.		(5)
<b>FILM AND READING EVALUATION BY GEODYNE</b>		
Record started: foot mark 6651+26	@ _____	hours, _____ Date _____
Record ended: foot mark 6682+10	@ _____	hours, _____ Date _____
Total footage 40' + 24'	Total elapsed time of record _____	
FILM EVALUATION: Alignment _____, Density _____		
Compass _____, Vane _____, Rotor _____, Time pulse _____		
Comments:		
Strip Chart:		
Magnetic Tape: 000 519 Part 4		
Date Completed: Film Processing _____, Reading 3-14-67		

SITE 7C. DATA SHEET—536 FOOT DEPTH (3544 FEET ABOVE  
BOTTOM) OCTOBER—NOVEMBER 1966

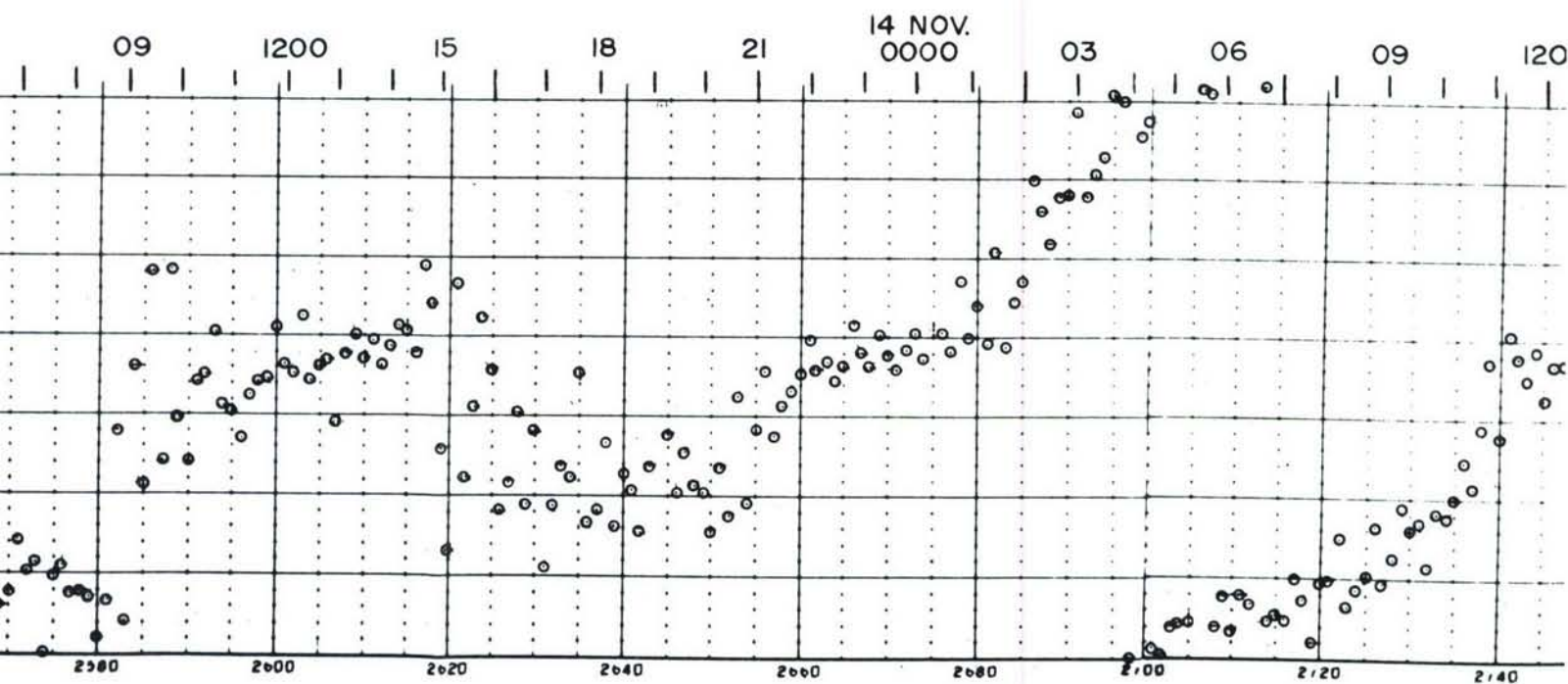
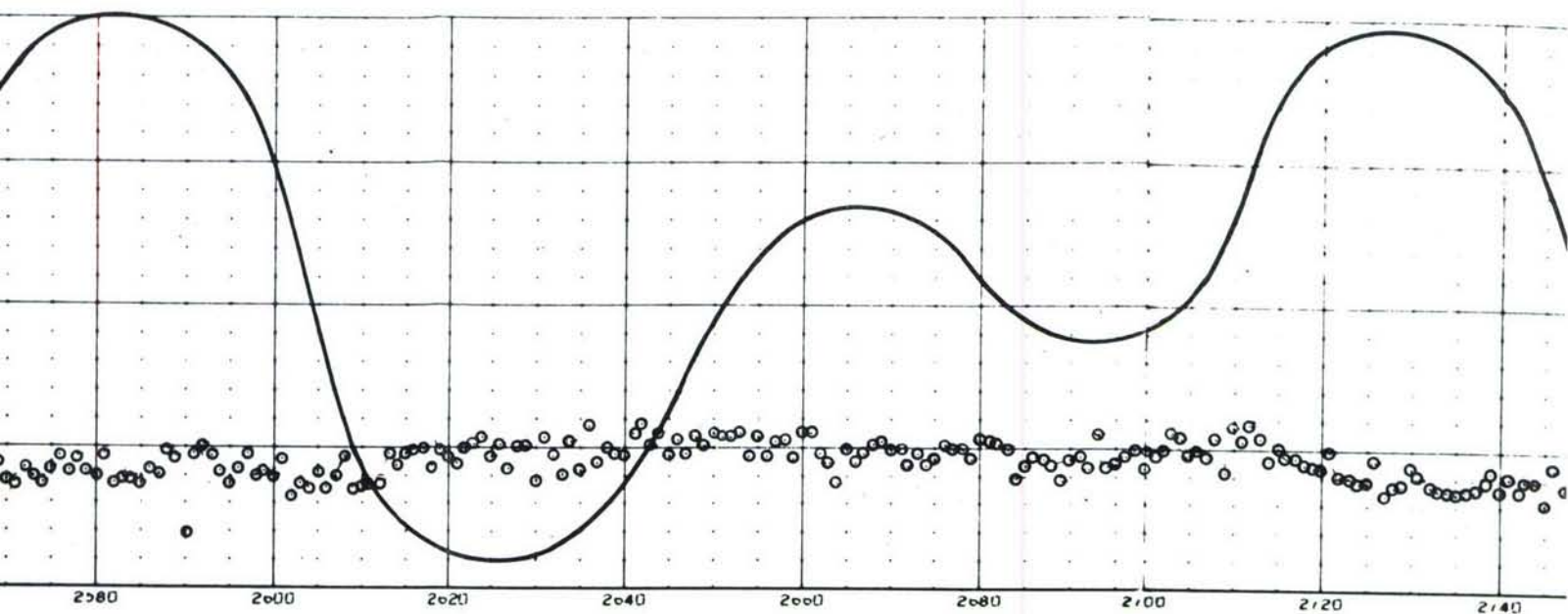




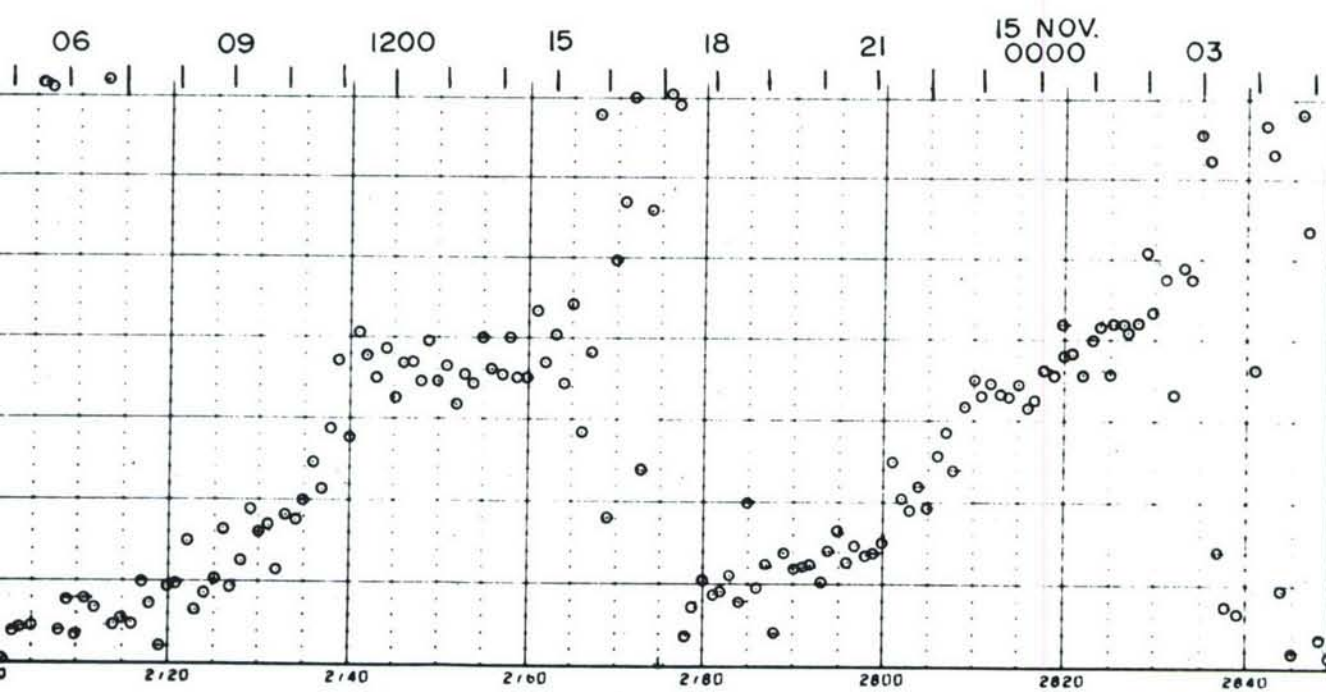
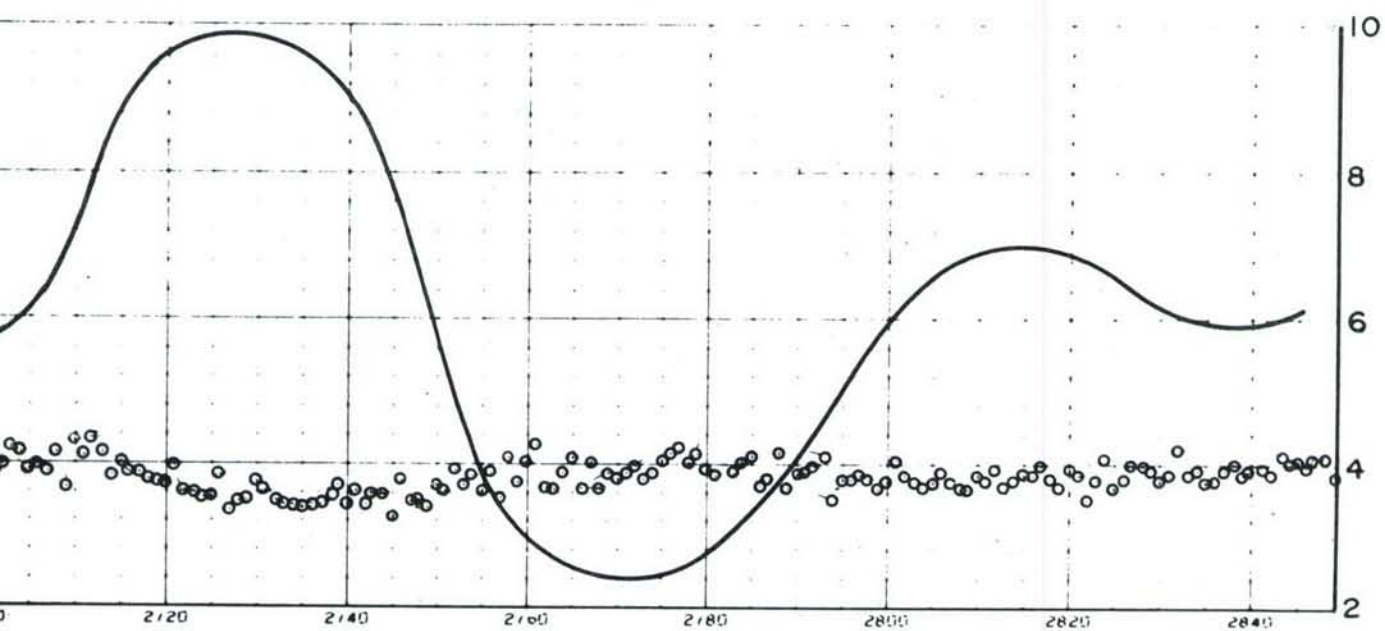


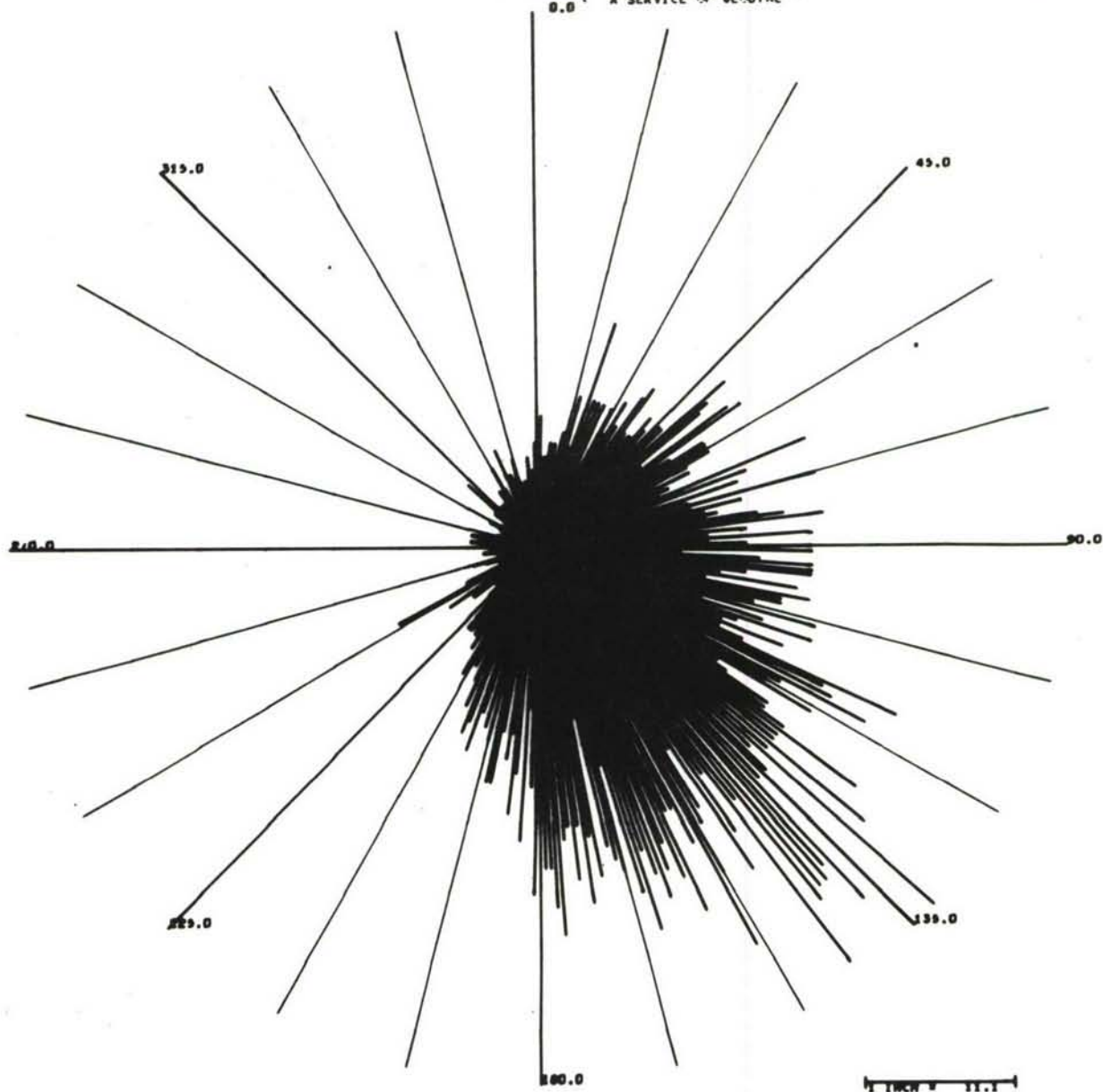


SITE 7C. CURRENT METER RECORD AND TIDE HEIGHT—5 DAY RECORD—536 FOOT DEPTH (3544 FEET ABOVE BOTTOM)

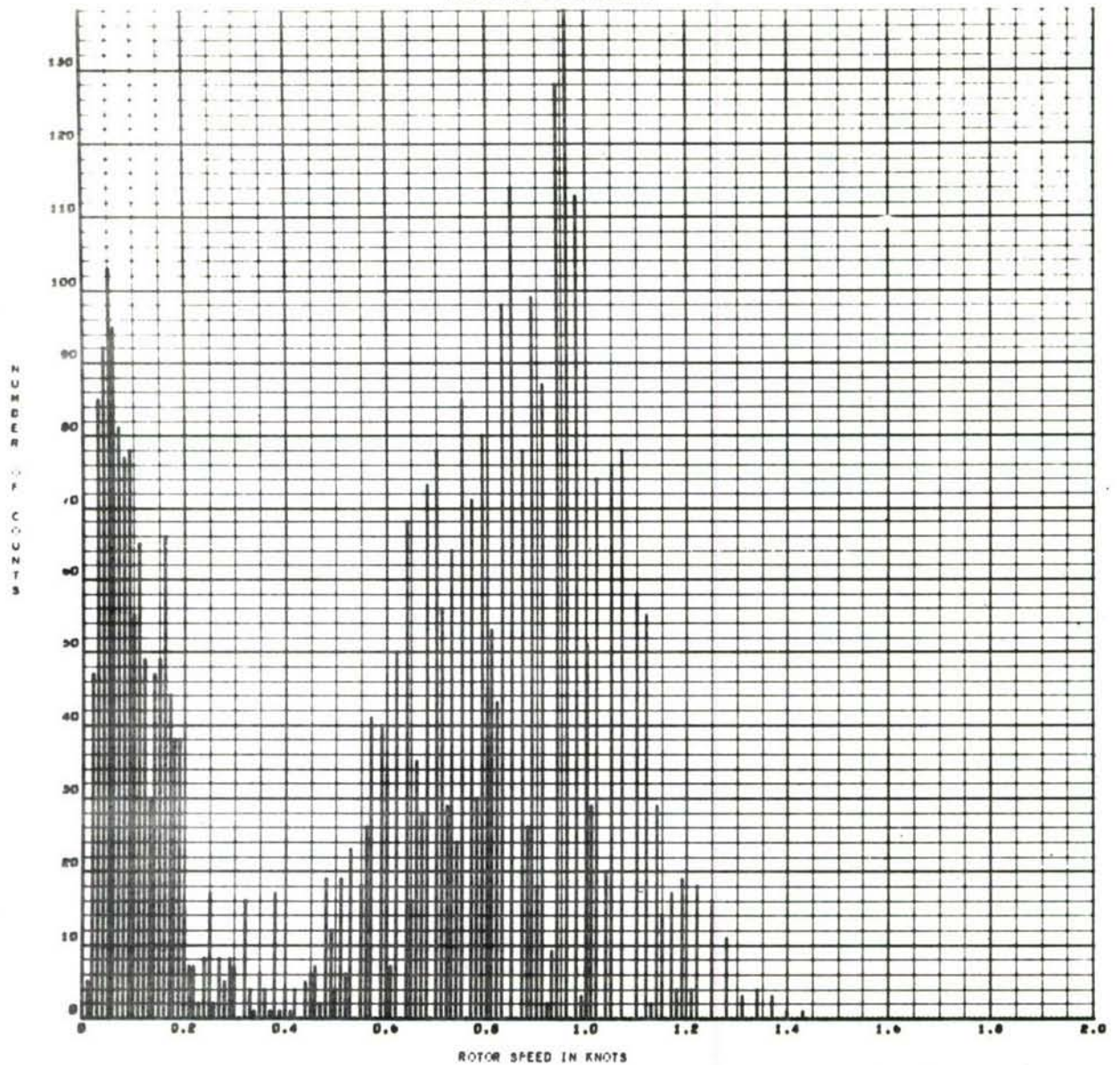






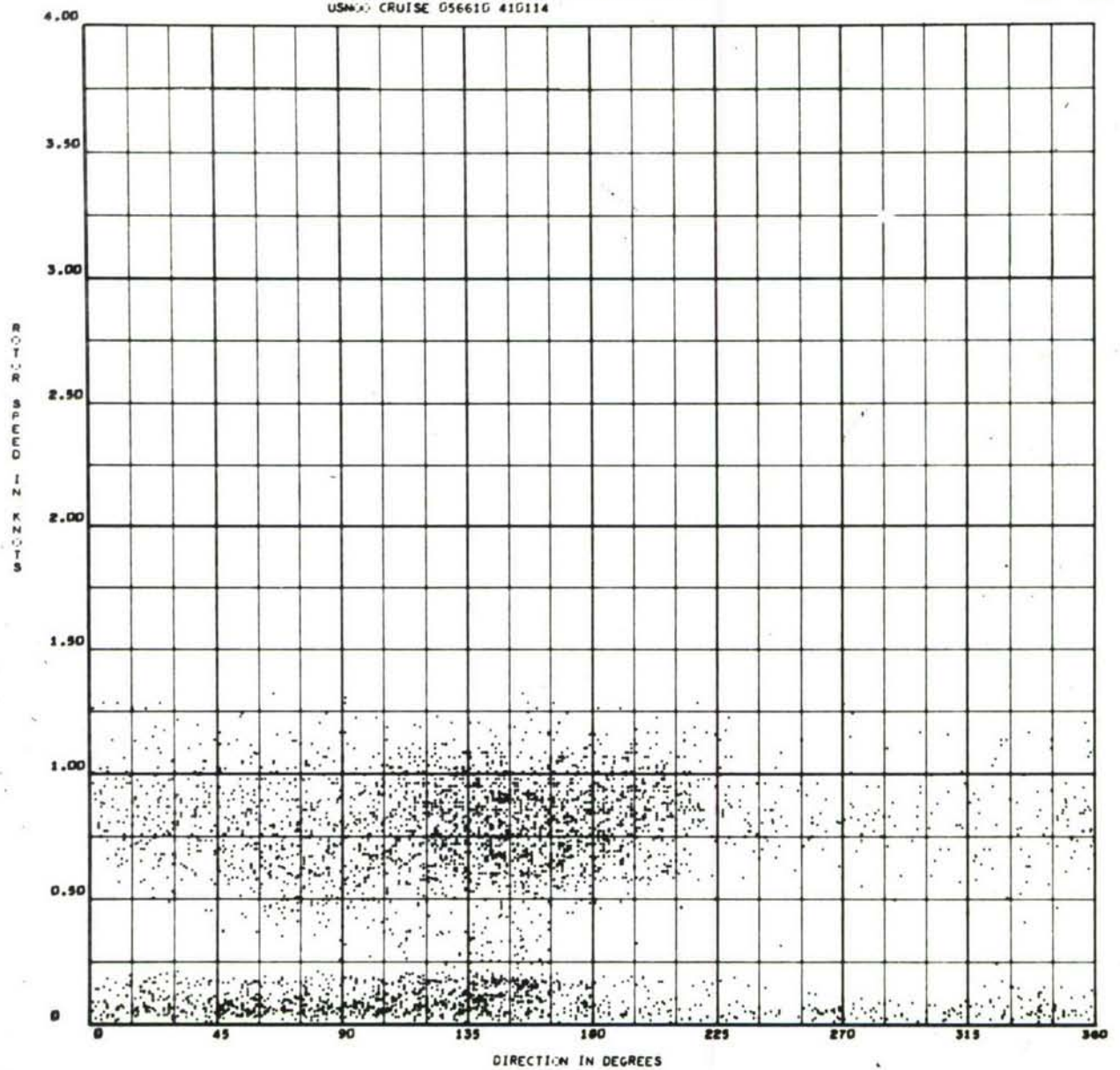


SITE 7C. POLAR COORDINATE HISTOGRAM 536 FOOT DEPTH  
(3544 FEET ABOVE BOTTOM) OCTOBER—NOVEMBER 1966



SITE 7C. HISTOGRAM OF ROTOR SPEED 536 FOOT DEPTH  
(3544 FEET ABOVE BOTTOM) OCTOBER—NOVEMBER 1966

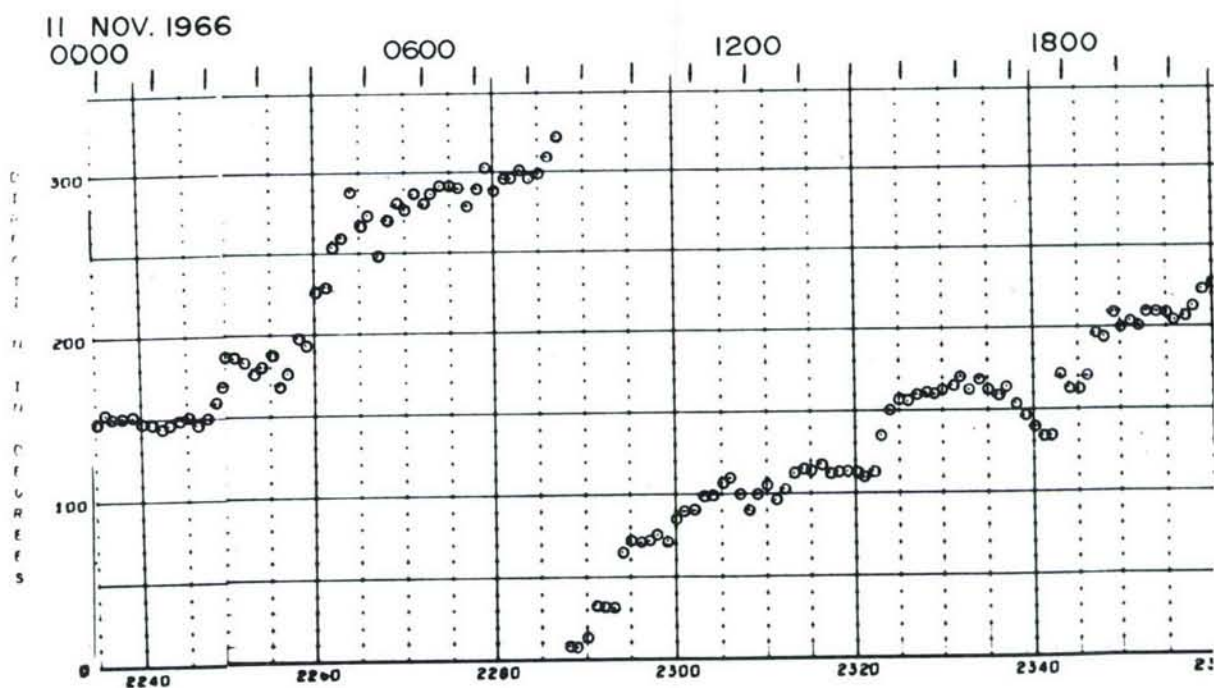
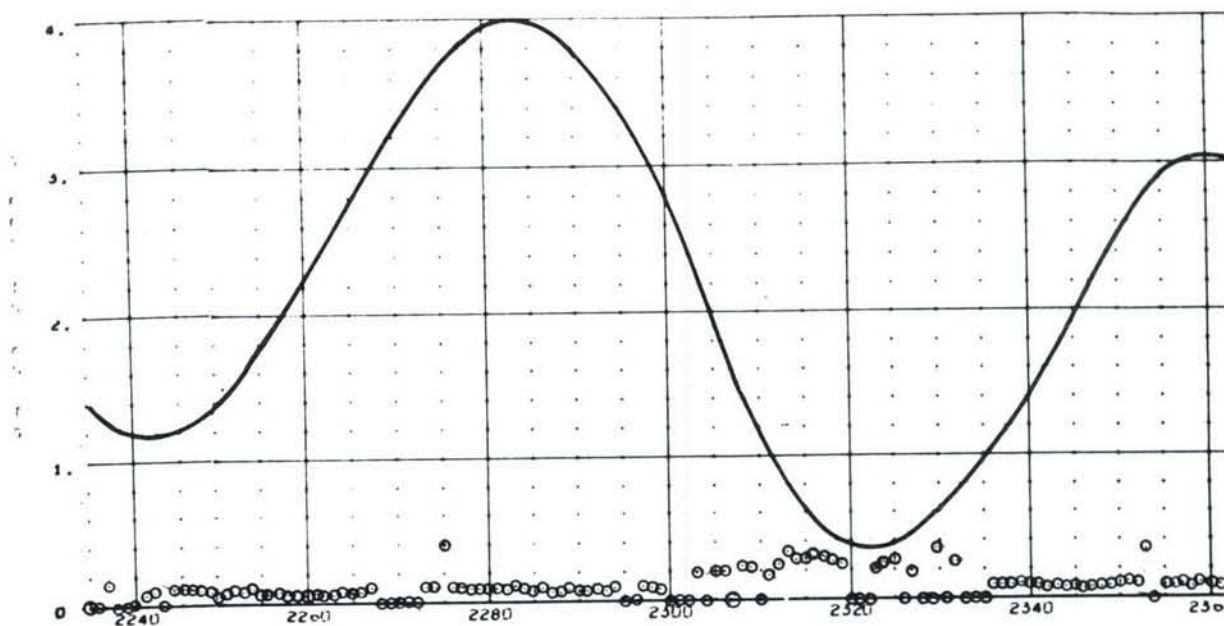




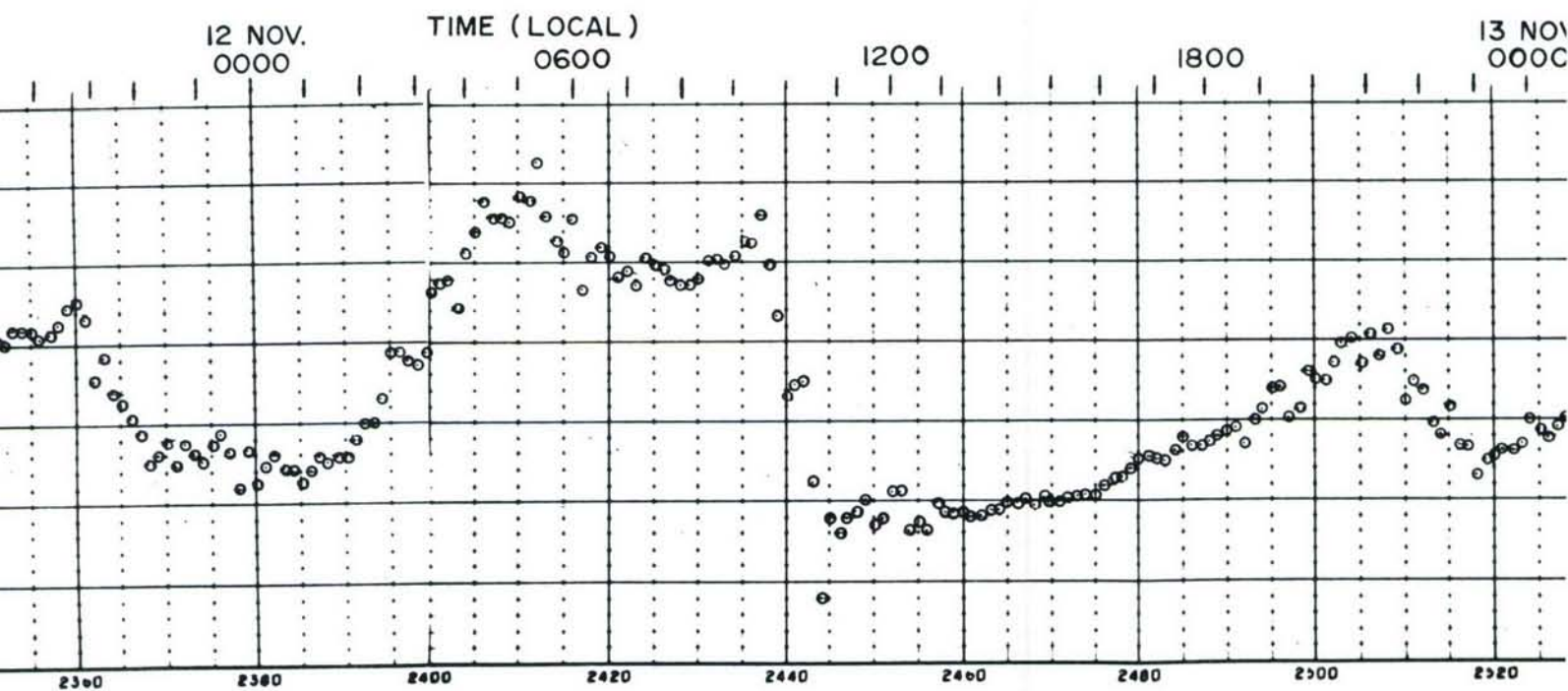
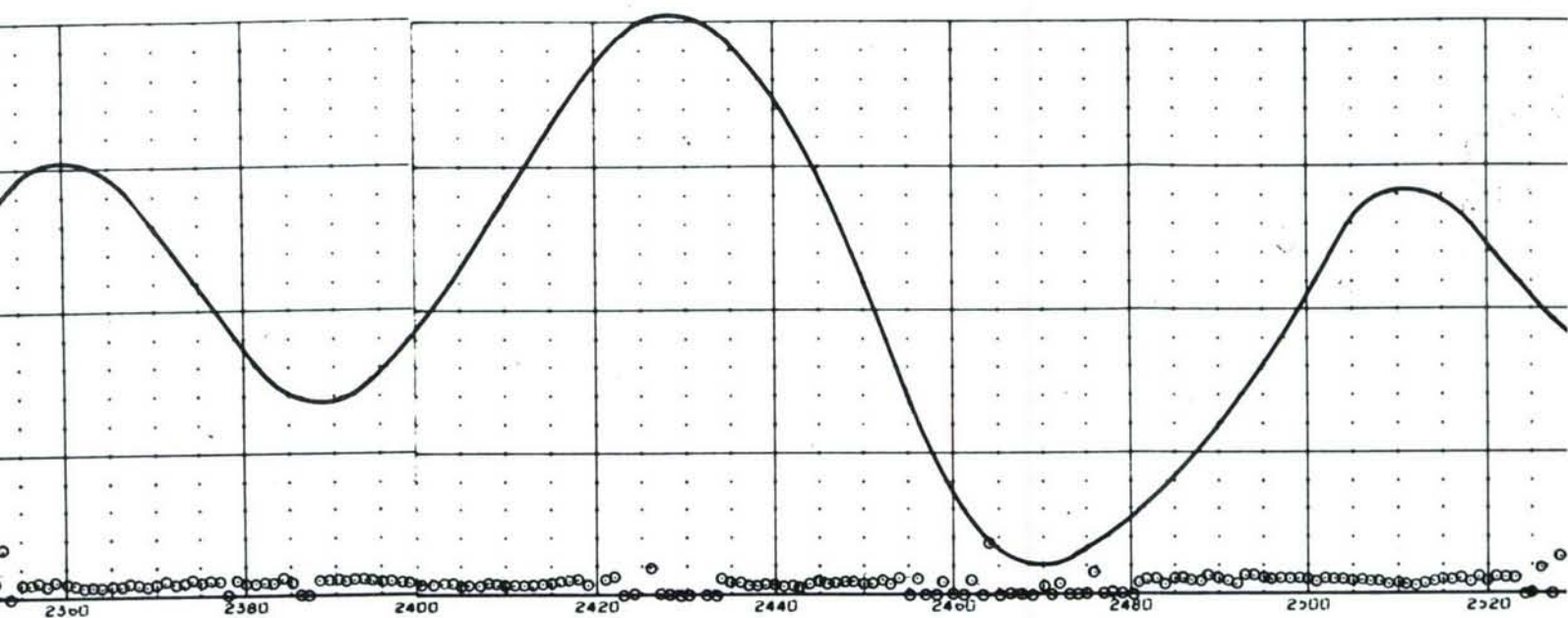
SITE 7C. SCATTER PLOT 536 FOOT DEPTH  
 (3544 FEET ABOVE BOTTOM) OCTOBER—NOVEMBER 1966

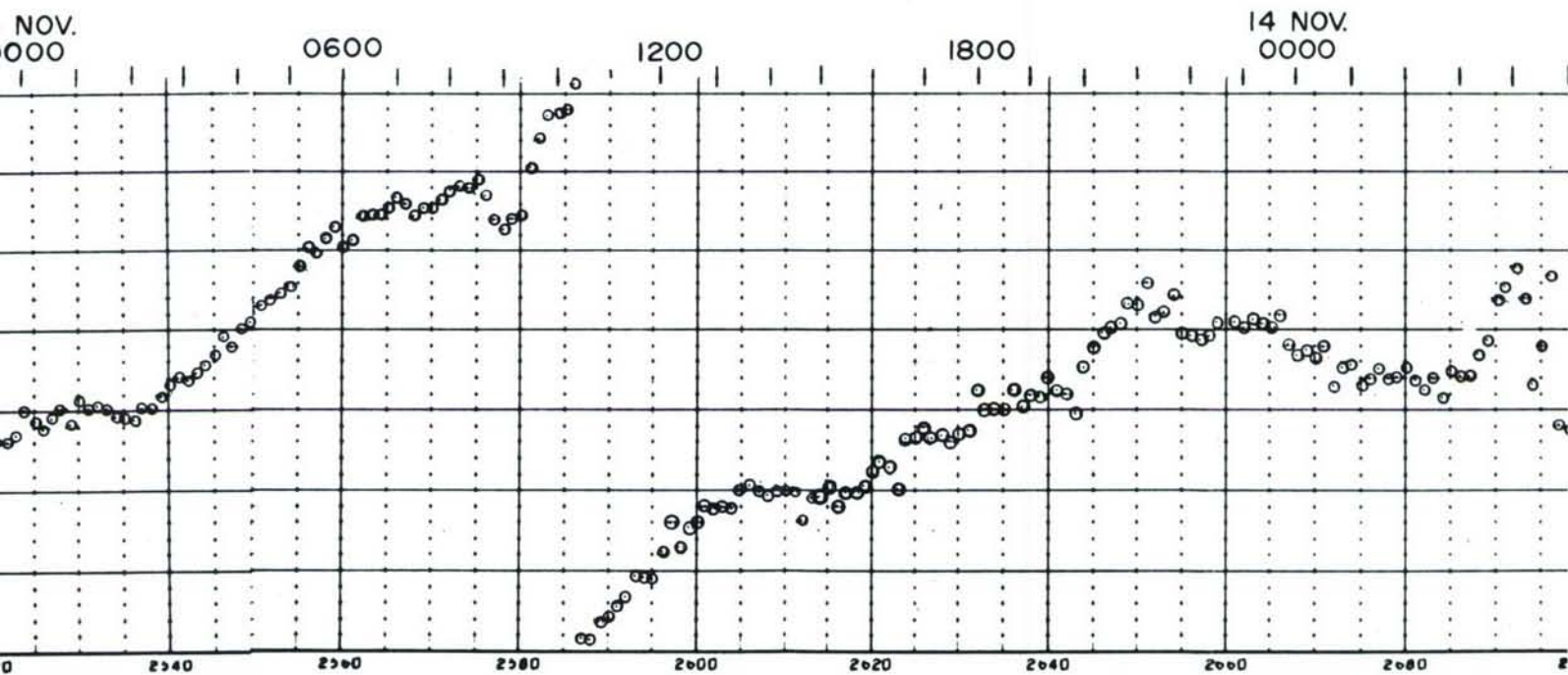
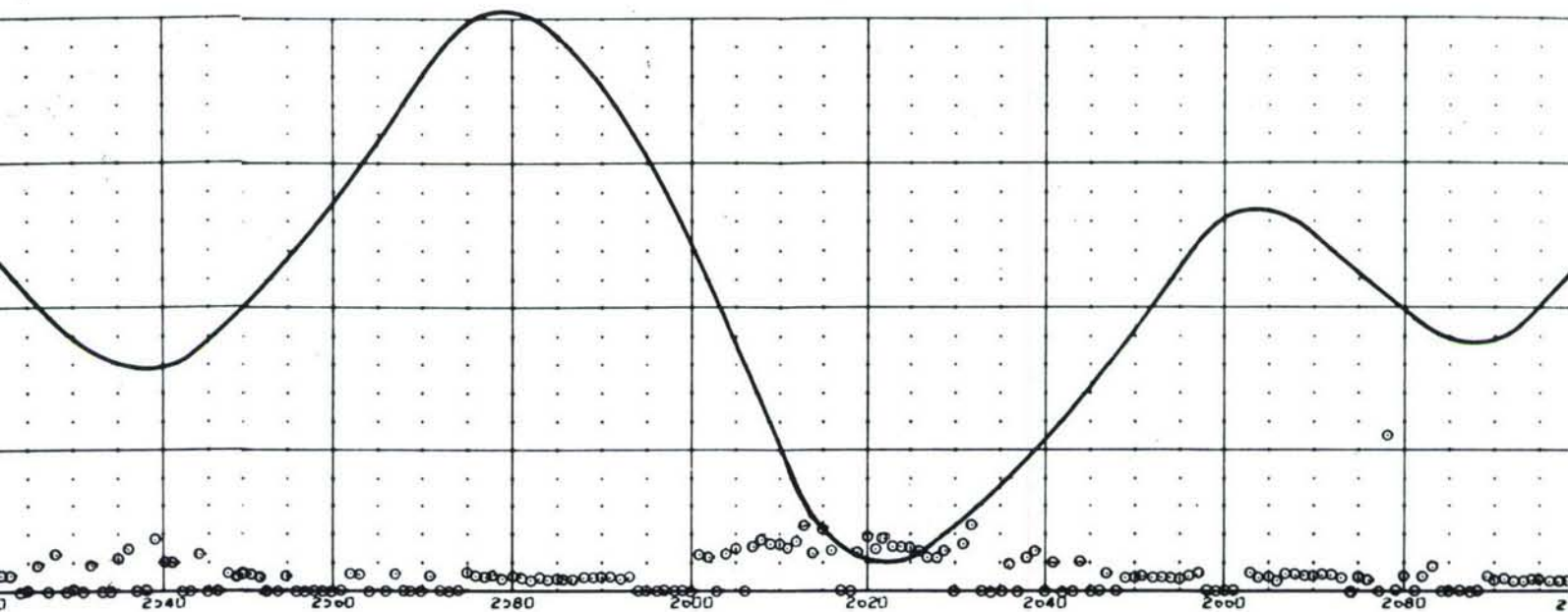
TITLE: <u>FILM PROCESSING AND READING LOG*</u>		<u>410111</u>	
FILM IDENTIFICATION BY CUSTOMER		Date <u>9 January 1967</u> Geodyne Assigned Film No. <u>383-7C</u>	
Name <u>Mr. <del>XXXXXXXXXX</del> Thomas G. Long</u>	Address <u>Naval Oceanographic Office</u> <u>Washington D.C.</u>		
Type of Instrument <u>A-100 Current Meter</u>	and Serial No. <u>383</u>		
Motor RPM _____	Film Advance Speed _____	No. Timer Cam Lobes <u>6</u>	
<input type="checkbox"/> Continuous or, <input checked="" type="checkbox"/> Interval Record,		Time Interval Between Records <u>5</u> Seconds	
Cruise <u>056610</u> , Location: Lat. <u>32° 56.7N</u> Long. <u>118° 19.75'W</u> Meter Depth <u>2195 feet</u>			
Magnetic variation (+ = East, - = West) <u>14° 26' East</u>			
Recording started at <u>1123</u> Hours, plus <u>8</u>		Time Zone, <u>26 Oct 1966</u>	Date _____
Recording ended at <u>1425</u> Hours, plus <u>8</u>		Time Zone, <u>23 Nov. 1966</u>	Date _____
Comments:  Station 7C, Water depth 4080 feet.			
<b>INSTRUCTIONS TO GEODYNE</b>			
<input type="checkbox"/> Process original film, <input type="checkbox"/> 100', <input type="checkbox"/> 150' <input type="checkbox"/> Print for hand reading (clear edge) <input type="checkbox"/> Print for automatic " (dark edge) <input checked="" type="checkbox"/> Analog strip chart record <input checked="" type="checkbox"/> Magnetic tape record		Store at Geodyne or send to: <u>Naval Oceanographic Office</u> <u>Washington D.C. 20390</u> <u>Attn: Ronald Kopenski, Code 9100</u>	
Other instructions:		Customer's Order No. <u>(6)</u>	
1. Process only that data between tape strips on the film. 2. Supply plots of direction versus time and speed versus time. 3. Supply scatter plots and histogram plots.			
<b>FILM AND READING EVALUATION BY GEODYNE</b>			
Record started: foot mark <u>6507 + 2</u> @ _____		hours, _____	Date _____
Record ended: foot mark <u>6547 + 30</u> @ _____		hours, _____	Date _____
Total footage <u>40' + 28"</u> , Total elapsed time of record _____			
FILM EVALUATION: Alignment _____, Density _____			
Compass _____, Vane _____, Rotor _____, Time pulse _____			
Comments:			
Strip Chart:			
Magnetic Tape: <u>900 519 Part 1</u>			
Date Completed: Film Processing _____, Reading <u>3-14-67</u>			

SITE 7C. DATA SHEET—2195 FOOT DEPTH (1885 FEET ABOVE  
BOTTOM) OCTOBER—NOVEMBER 1966

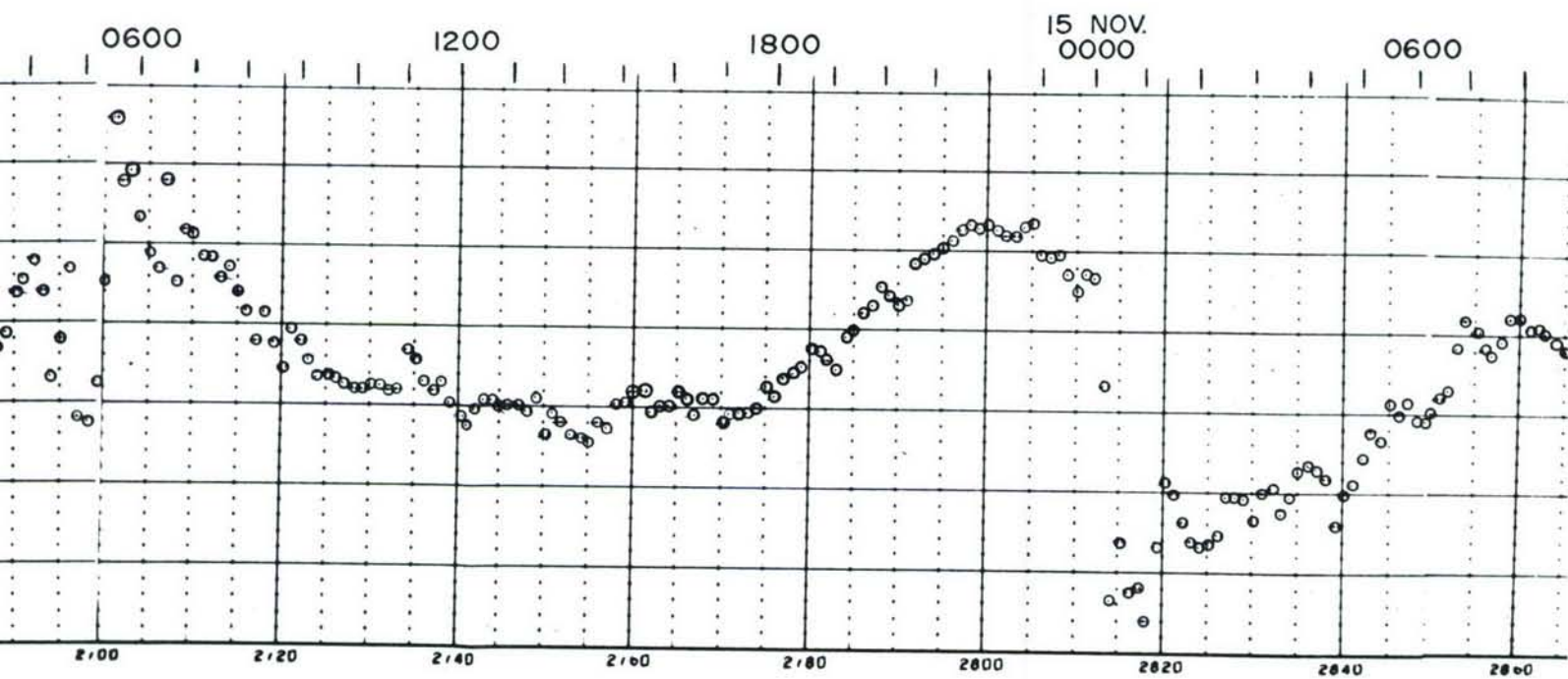
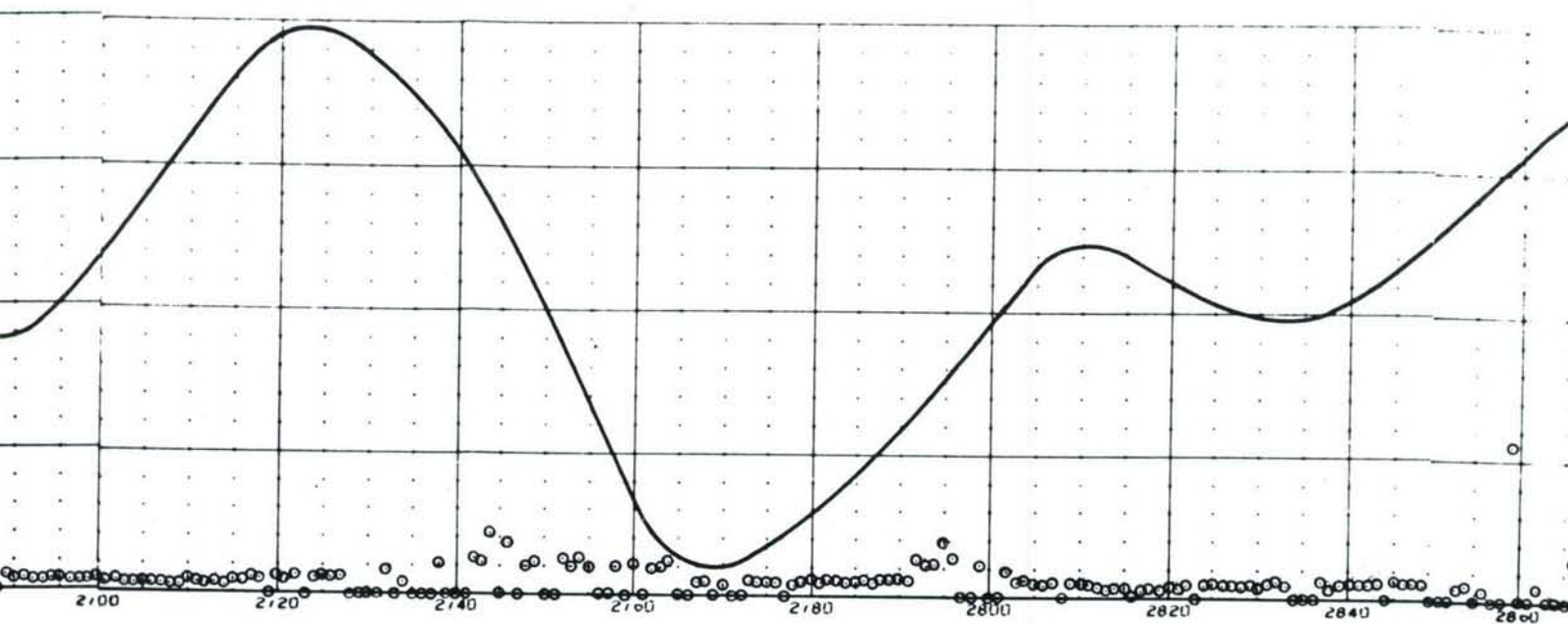




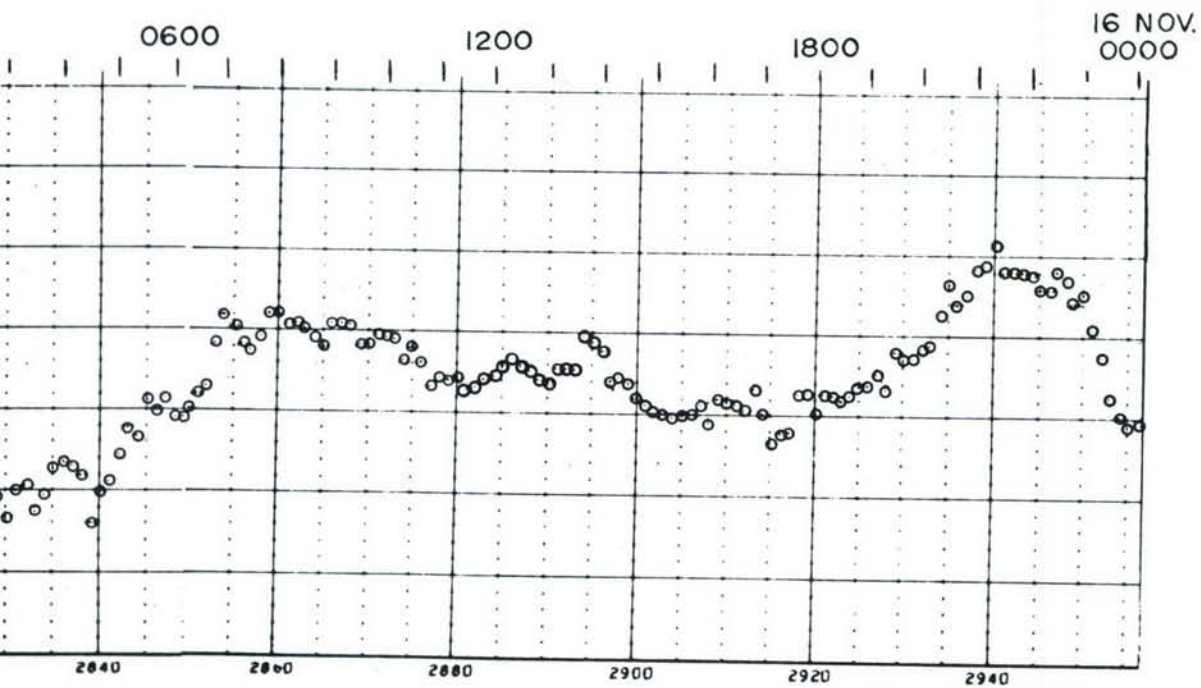
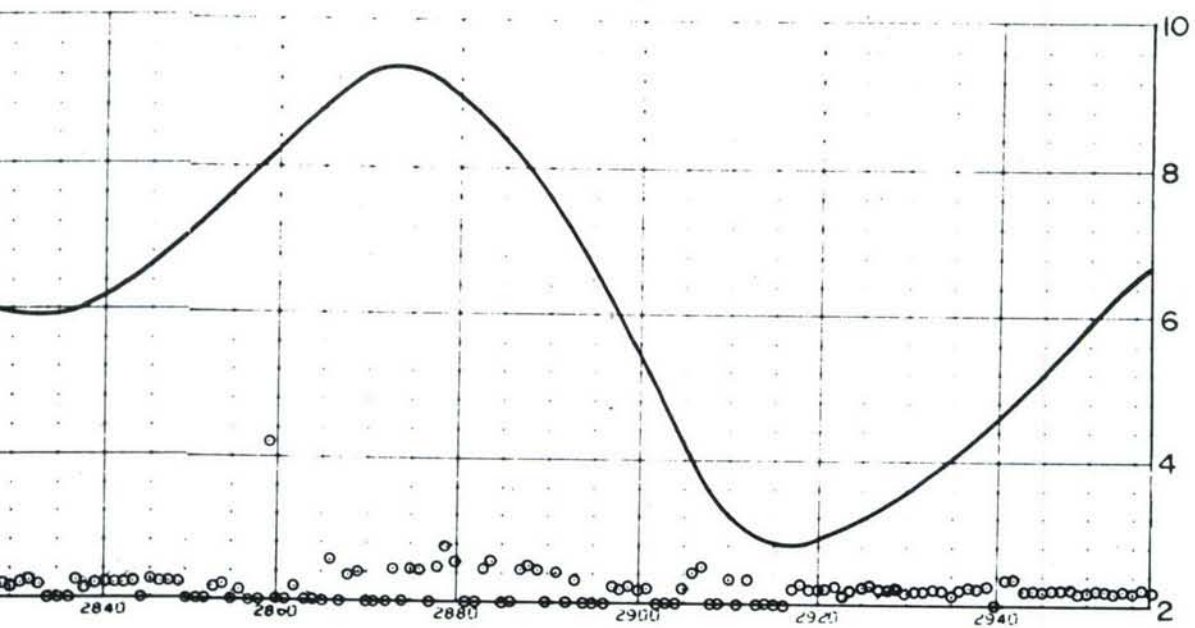


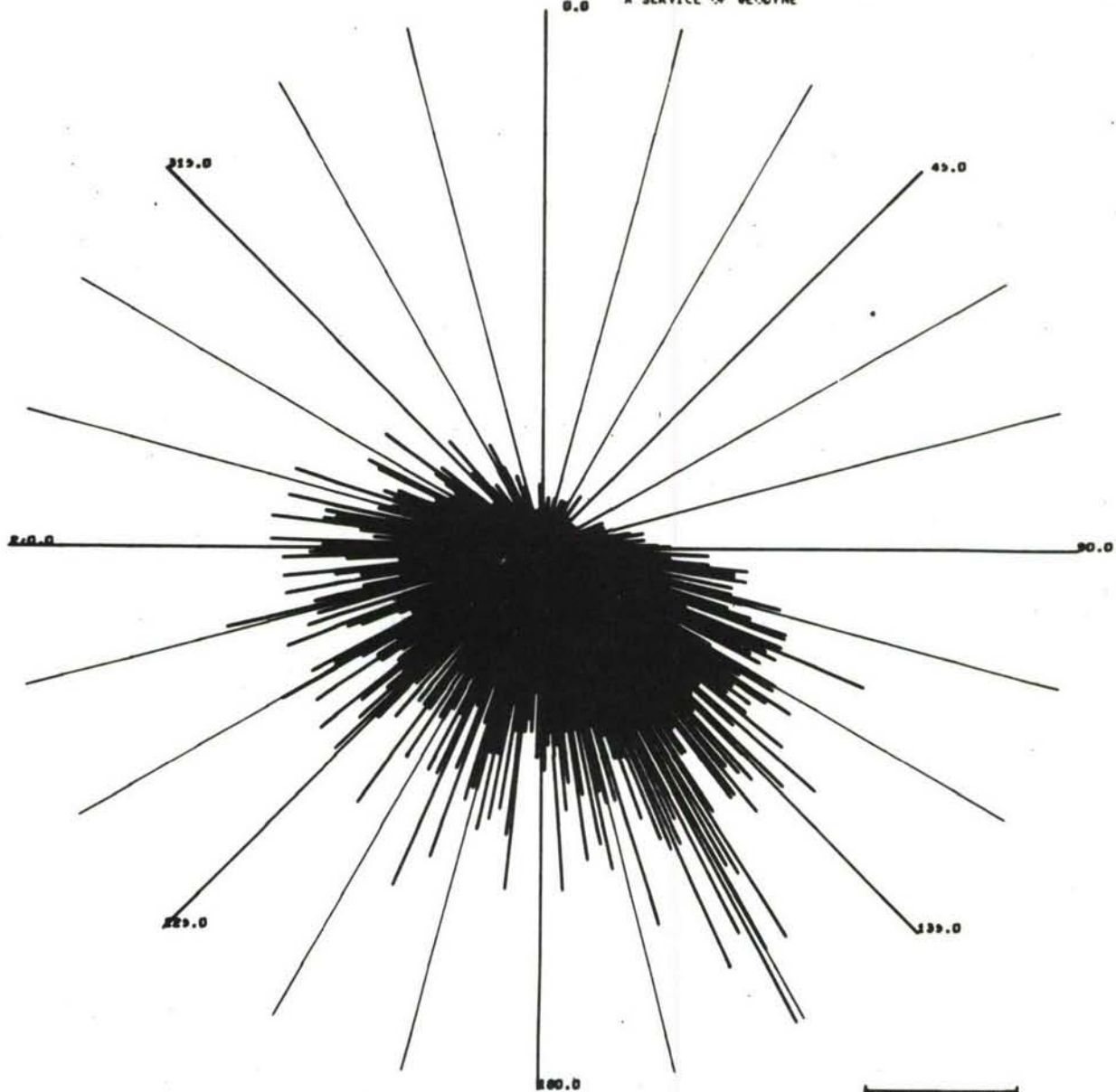


SITE 7C. CURRENT METER RECORD AND TIDE HEIGHT—5 DAY RECORD—2195 FOOT DEPTH (1885 FEET ABOVE BOTTOM)





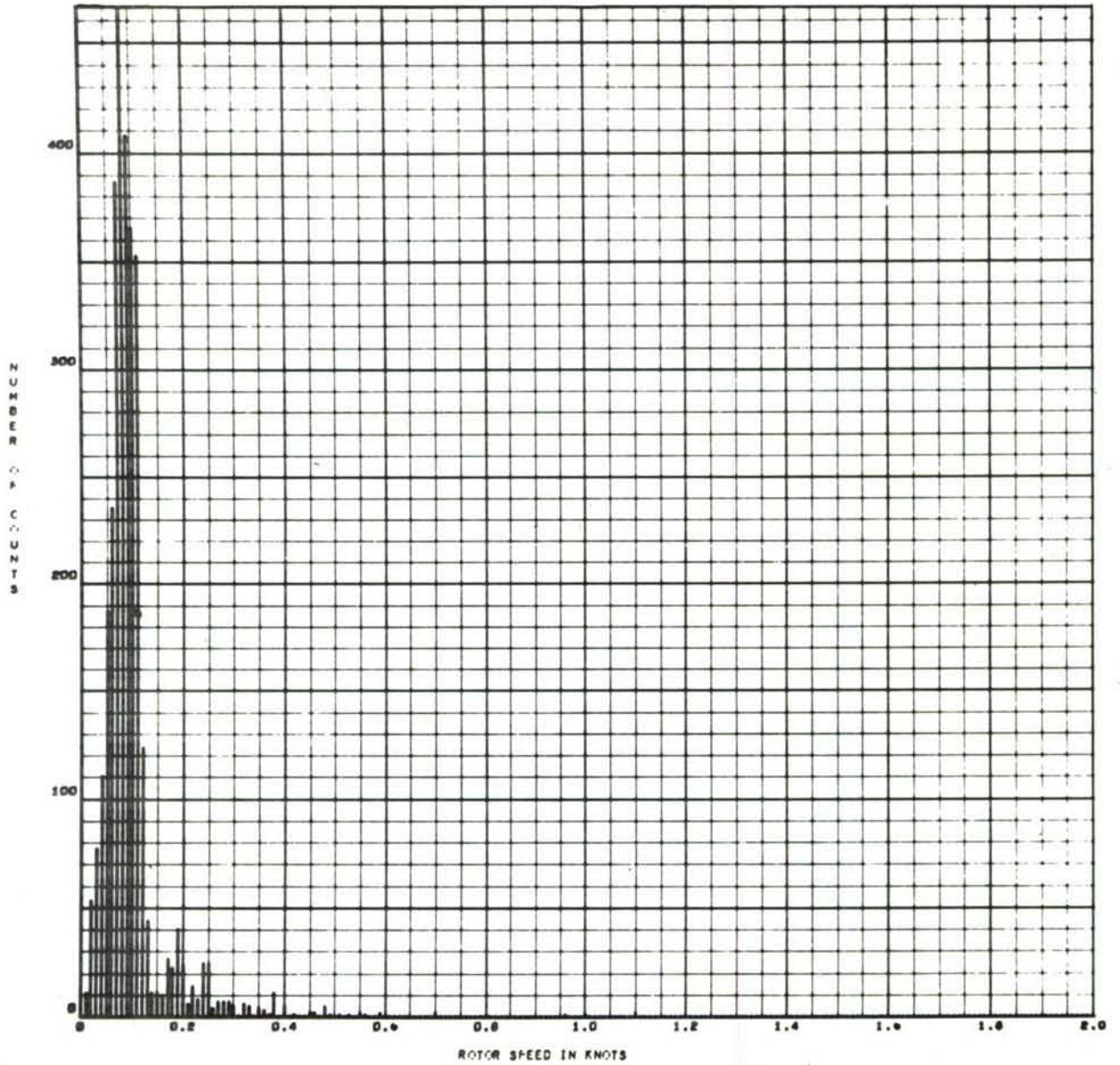




SITE 7C. POLAR COORDINATE HISTOGRAM 2195 FOOT DEPTH  
(1885 FEET ABOVE BOTTOM) OCTOBER—NOVEMBER 1966

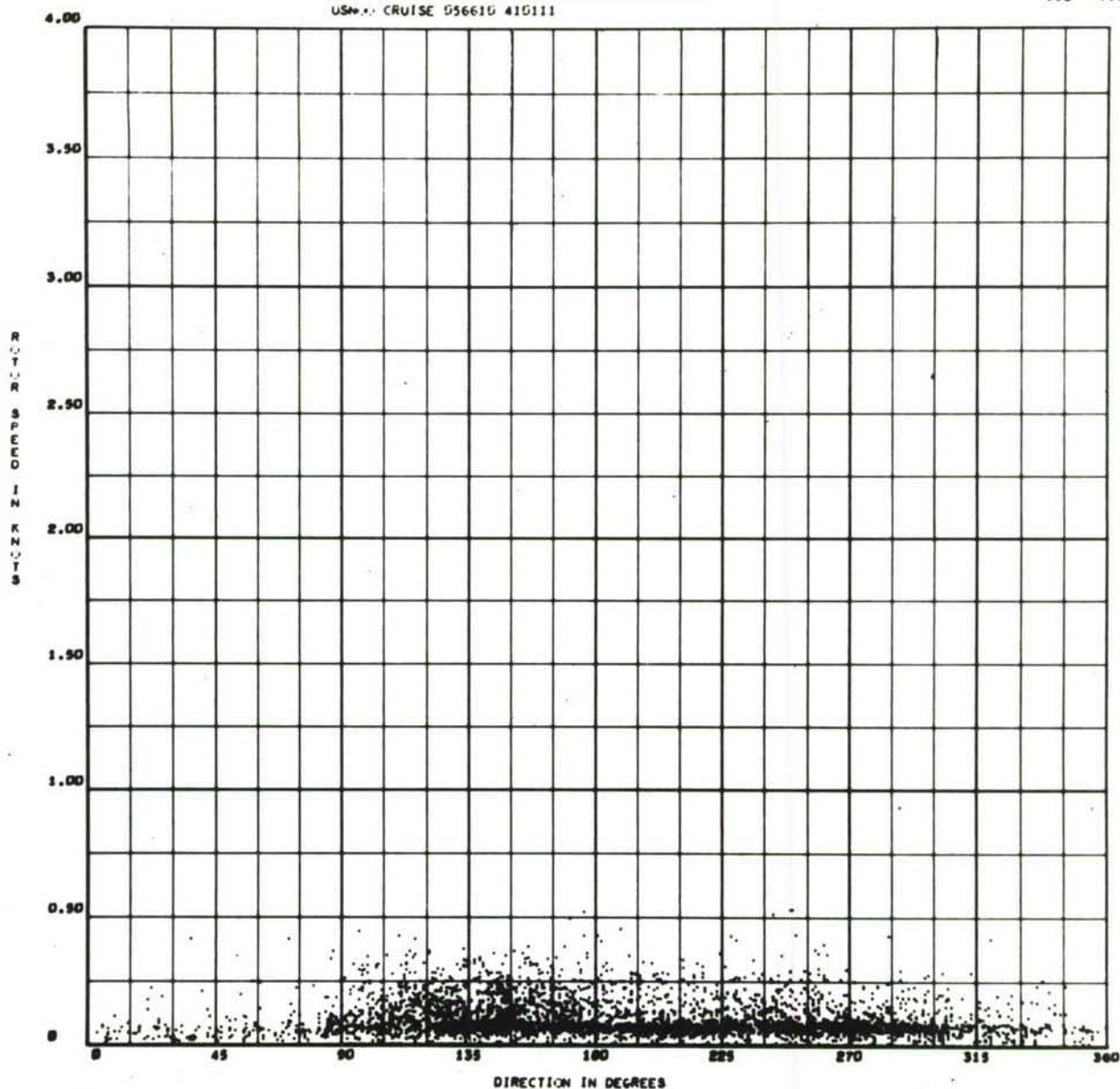
# HISTOGRAM OF ROTOR SPEED

034 028



SITE 7C. HISTOGRAM OF ROTOR SPEED 2195 FOOT DEPTH  
(1885 FEET ABOVE BOTTOM) OCTOBER—NOVEMBER 1966





SITE 7C. SCATTER PLOT 2195 FOOT DEPTH  
(1885 FEET ABOVE BOTTOM) OCTOBER—NOVEMBER 1966

TITLE: FILM PROCESSING AND READING LOG\*

410 115

## FILM IDENTIFICATION BY CUSTOMER

Date 9 January 1967

Geodyne Assigned Film No.

Name ~~XXXXXXXXXXXX~~ Thomas G. LongAddress Naval Oceanographic OfficeWashington D.C. 20390

177-7C

Customer's film identification

Type of Instrument A-100 Current Meterand Serial No. 177

Motor RPM \_\_\_\_\_, Film Advance Speed \_\_\_\_\_

No. Timer Cam Lobes 6☐ Continuous or, ☒ Interval Record,Time Interval Between Records 5 SecondsCruise 056610, Location: Lat. 32° 56.7'N Long. 118° 19.75'W Meter Depth 27 feetMagnetic variation (+ = East, - = West) 14° 26' East

above bottom

Recording started at 1123 Hours, plus 8 Time Zone, 26 Oct 1966 DateRecording ended at 1425 Hours, plus 8 Time Zone, 23 Nov 1966 Date

## Comments:

Station 7C, Water depth 4080 feet

## INSTRUCTIONS TO GEODYNE

Store at Geodyne or send to:

☐ Process original film, ☒ 100', ☐ 150'Naval Oceanographic Office☐ Print for hand reading (clear edge)Washington D.C. 20390☐ Print for automatic " (dark edge)Attn: Ronald Kopenski, Code 9100☒ Analog strip chart record☒ Magnetic tape record

## Other instructions:

1. Process only that data between tape strips on the film.
2. Supply plots of direction versus time and speed versus time.
3. Supply scatter plots and histogram plots.

Customer's Order No. (7)

## FILM AND READING EVALUATION BY GEODYNE

Record started: foot mark 6702 + 34 @ \_\_\_\_\_ hours, \_\_\_\_\_ DateRecord ended: foot mark 6770 + 28 @ \_\_\_\_\_ hours, \_\_\_\_\_ DateTotal footage 17 724, Total elapsed time of record \_\_\_\_\_

FILM EVALUATION: Alignment \_\_\_\_\_, Density \_\_\_\_\_

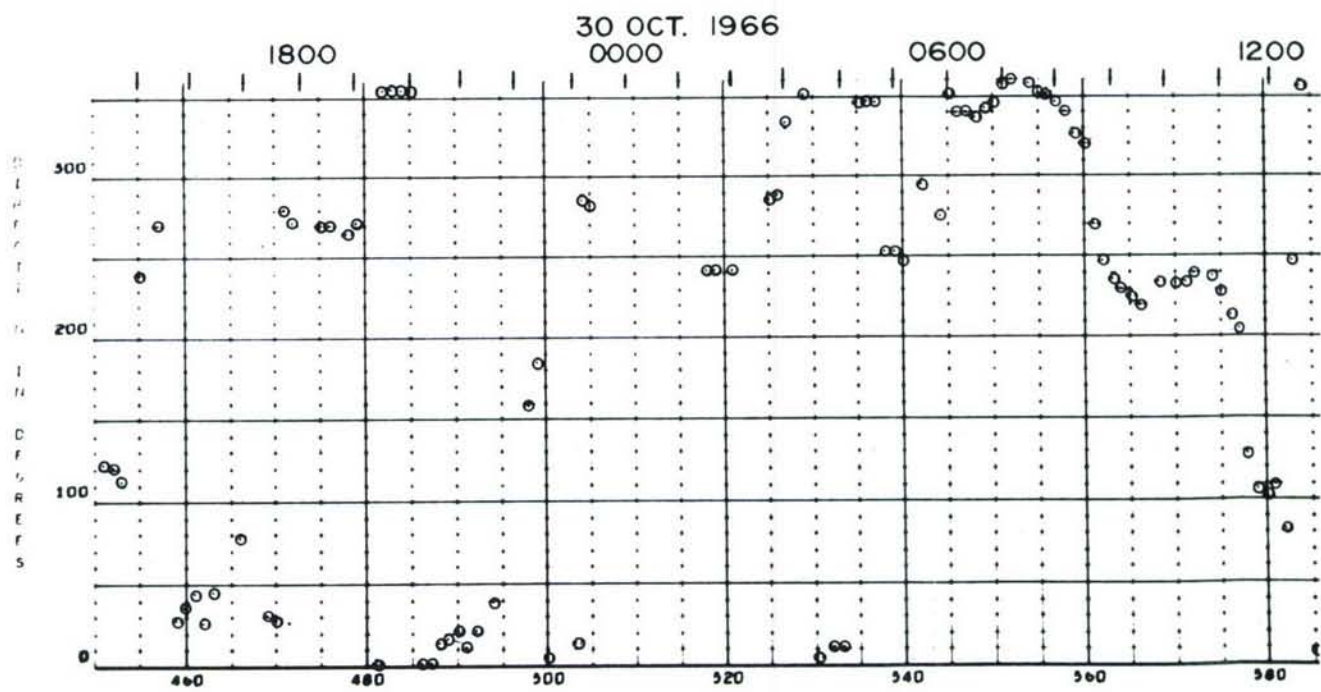
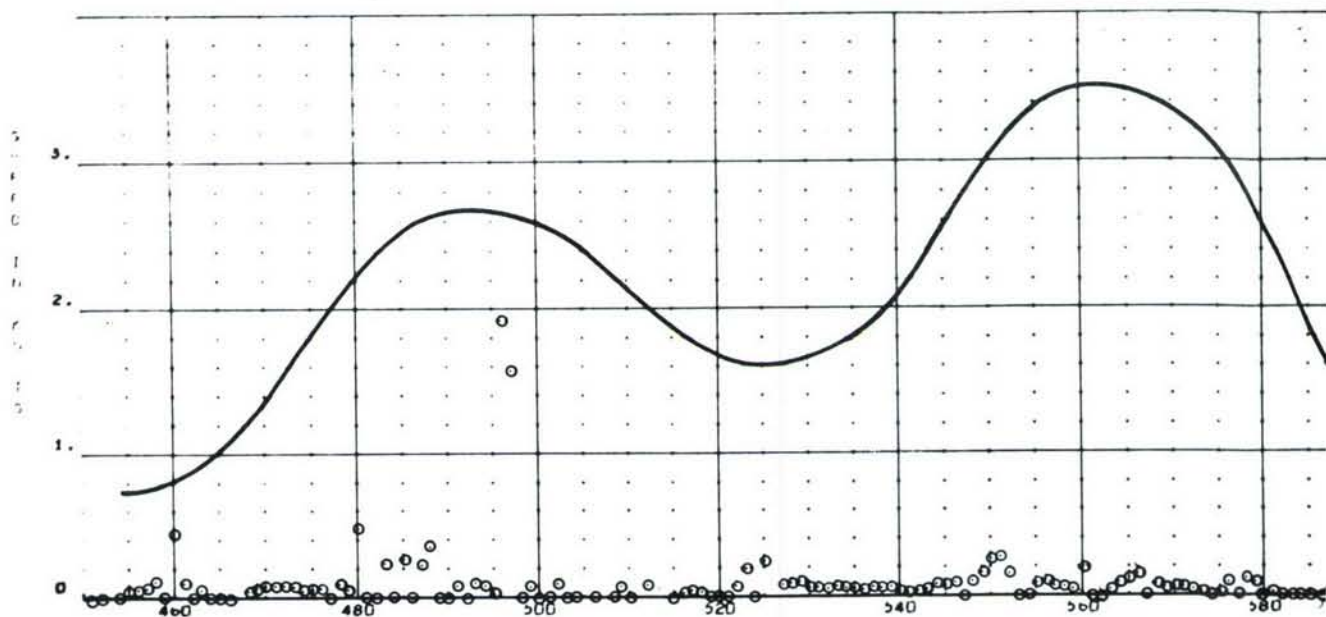
Compass \_\_\_\_\_, Vane \_\_\_\_\_, Rotor \_\_\_\_\_, Time pulse \_\_\_\_\_

## Comments:

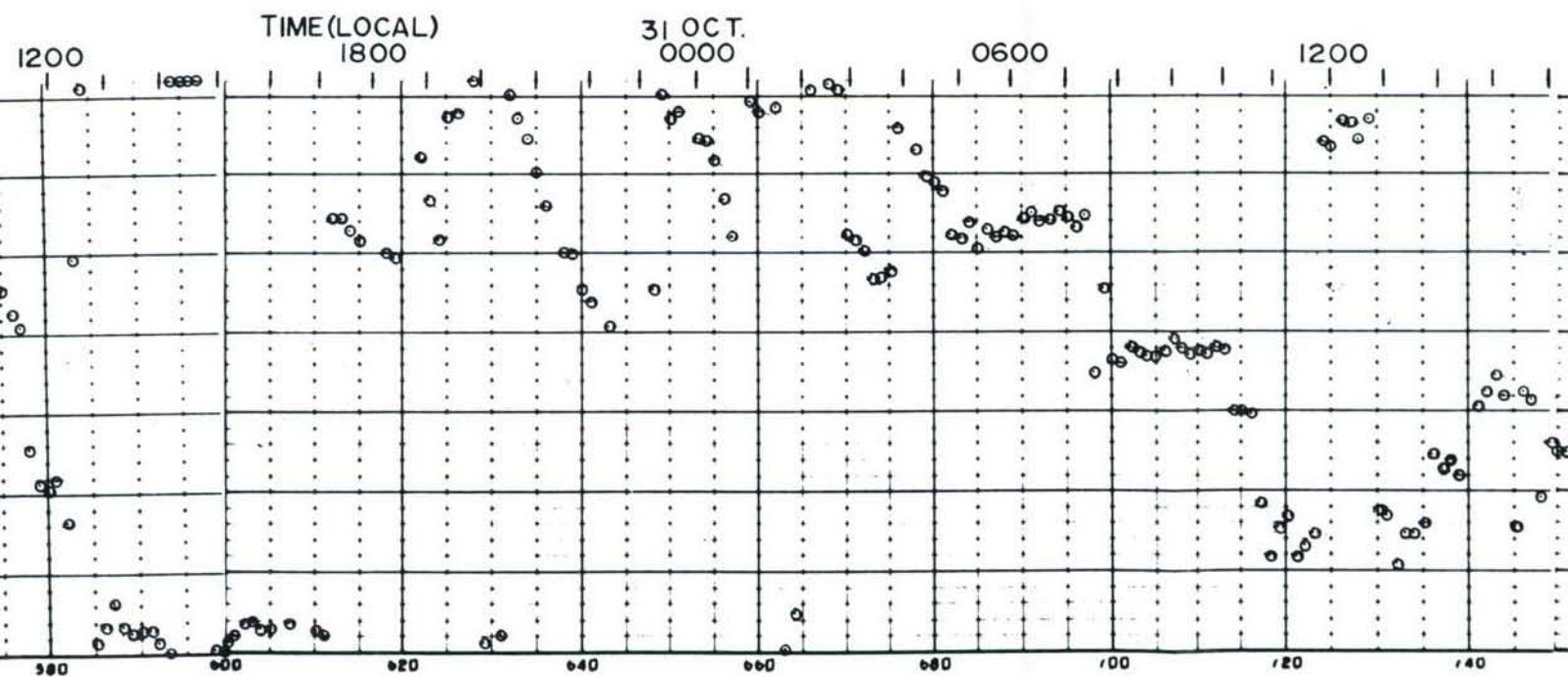
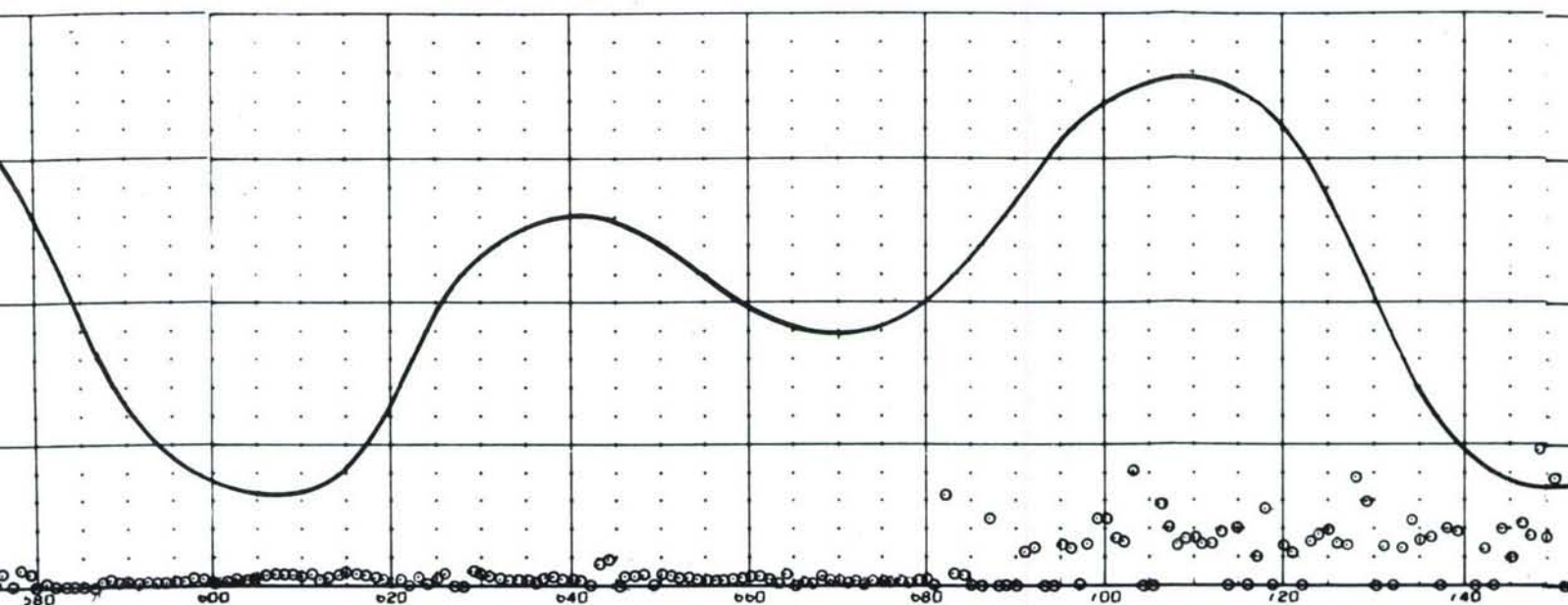
## Strip Chart:

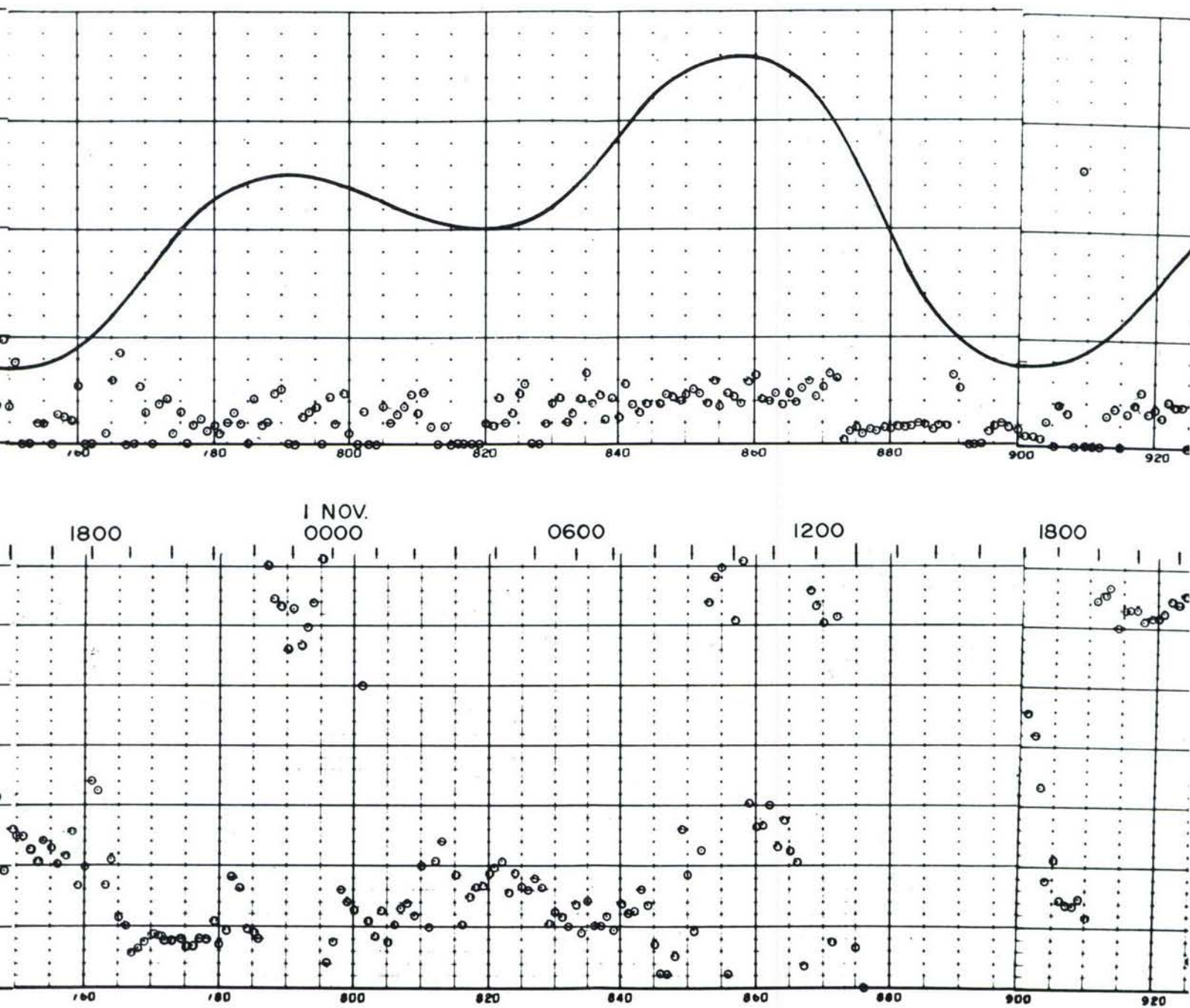
Magnetic Tape: 000 519 Part 5Date Completed: Film Processing \_\_\_\_\_, Reading 3-14-67

SITE 7C. DATA SHEET—4053 FOOT DEPTH (27 FEET ABOVE  
BOTTOM) OCTOBER—NOVEMBER 1966

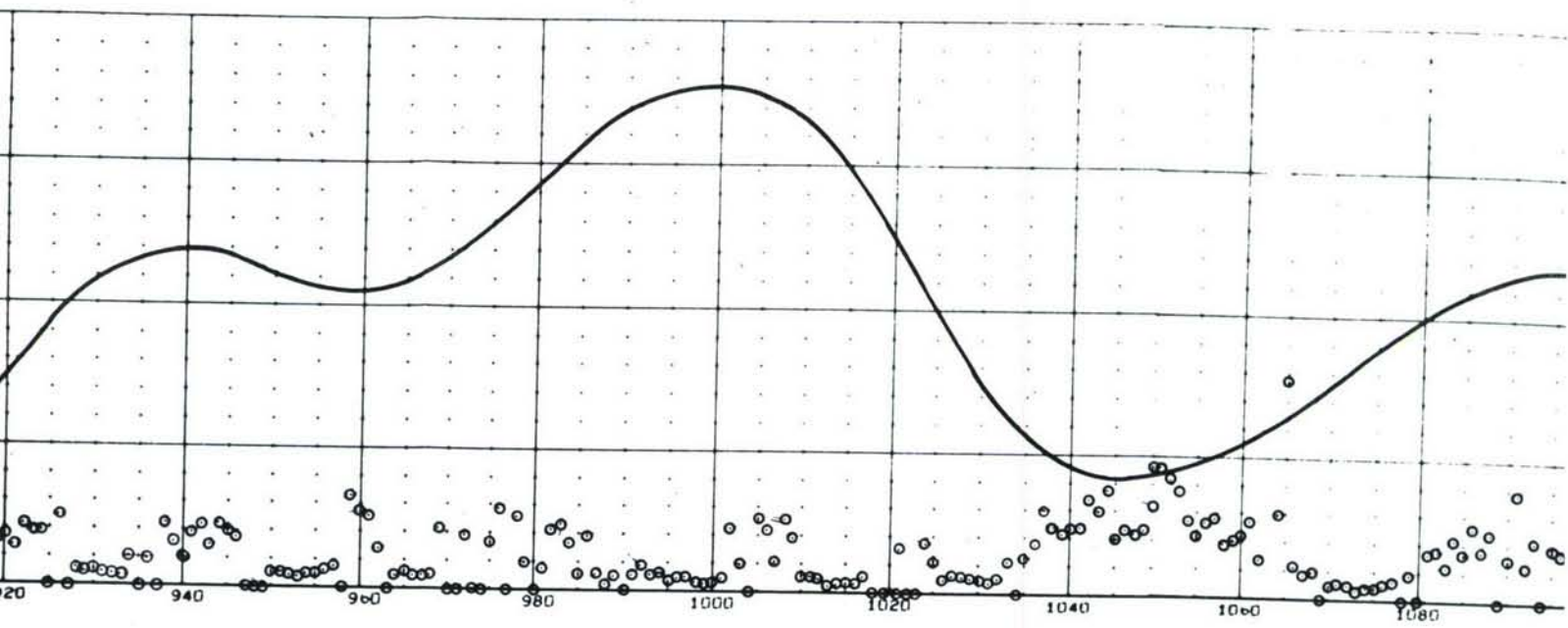








SITE 7C. CURRENT METER RECORD AND TIDE HEIGHT—5 DAY RECORD—4053 FOOT DEPTH (27 FEET ABOVE BOTTOM)



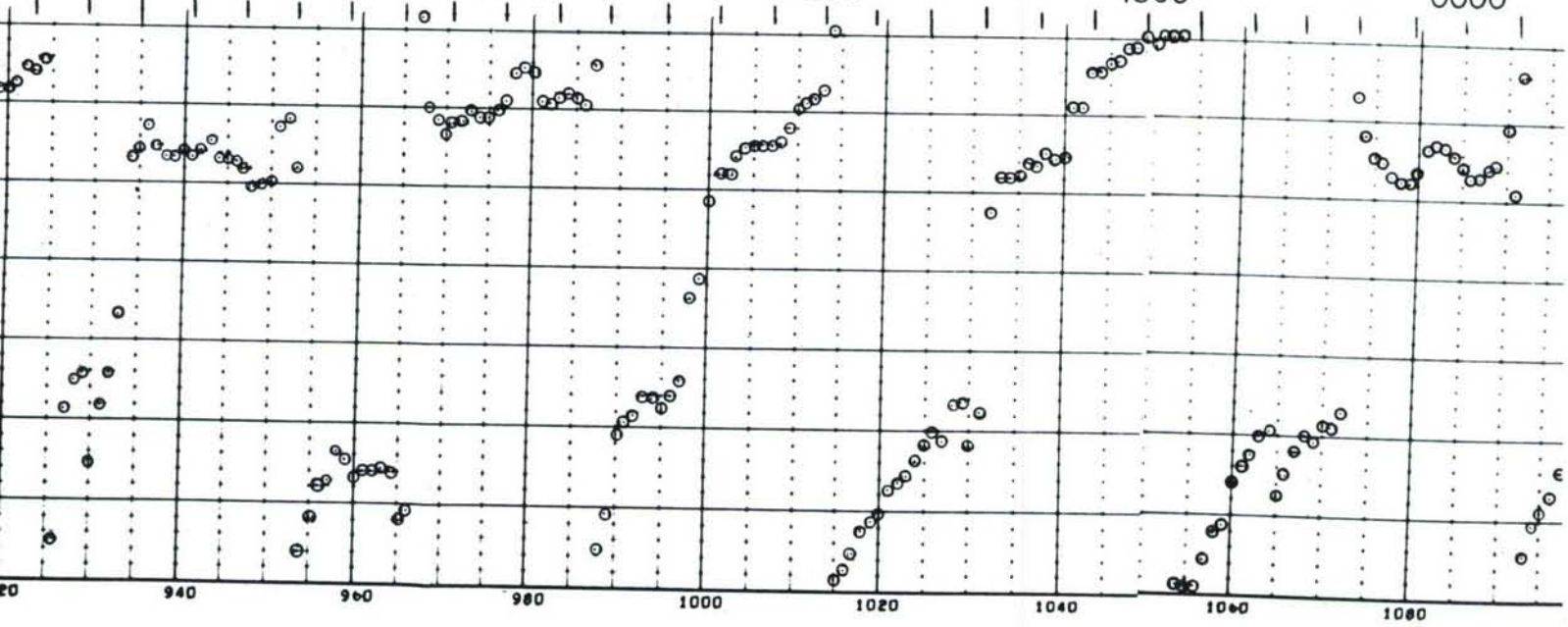
2 NOV.  
0000

0600

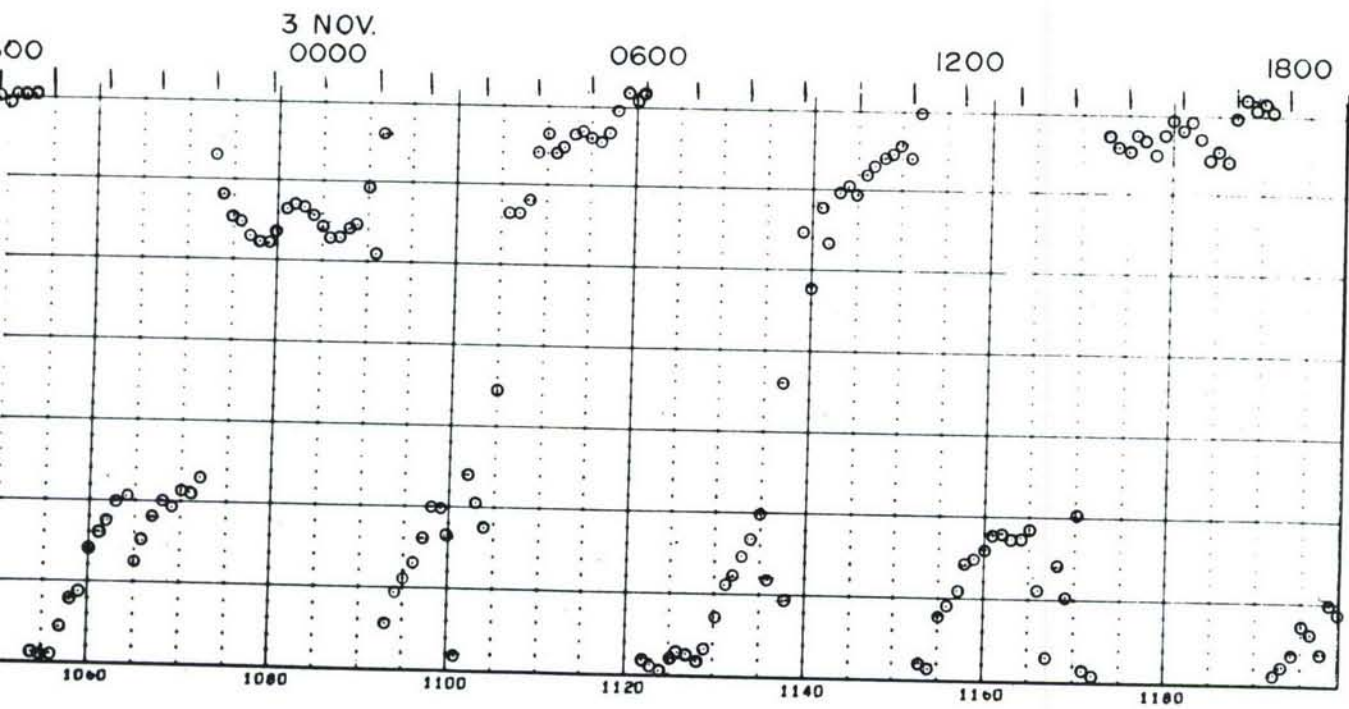
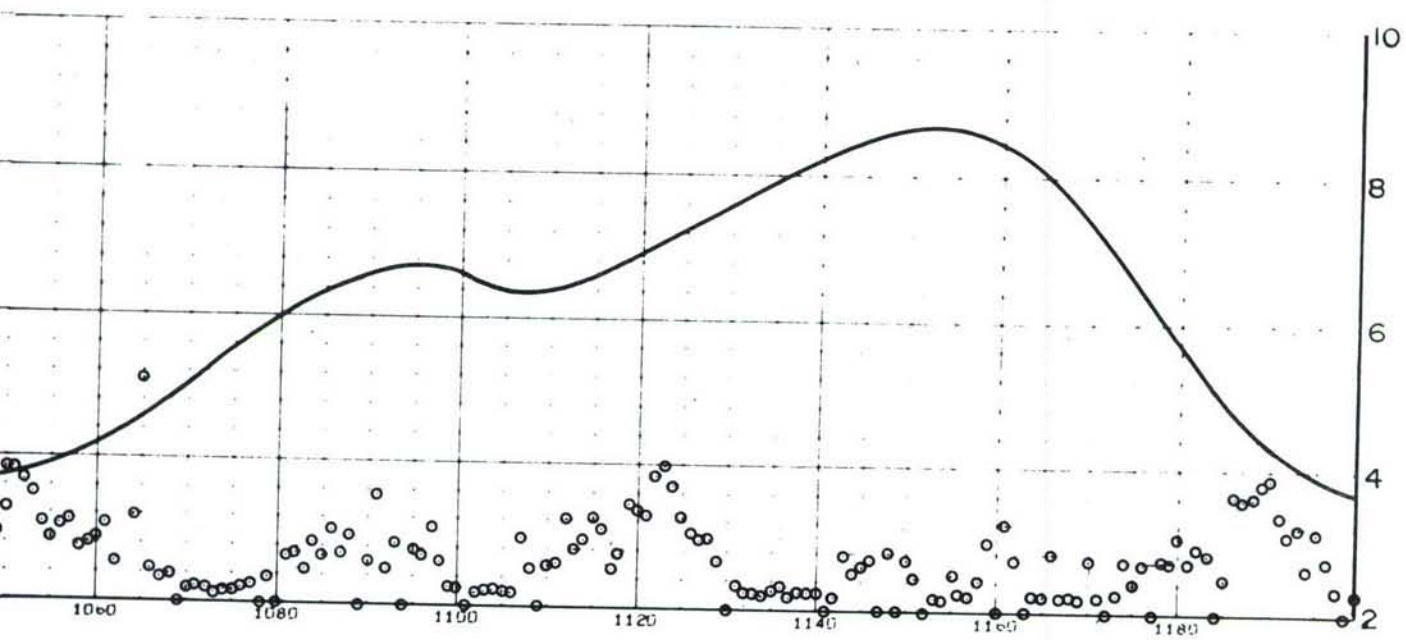
1200

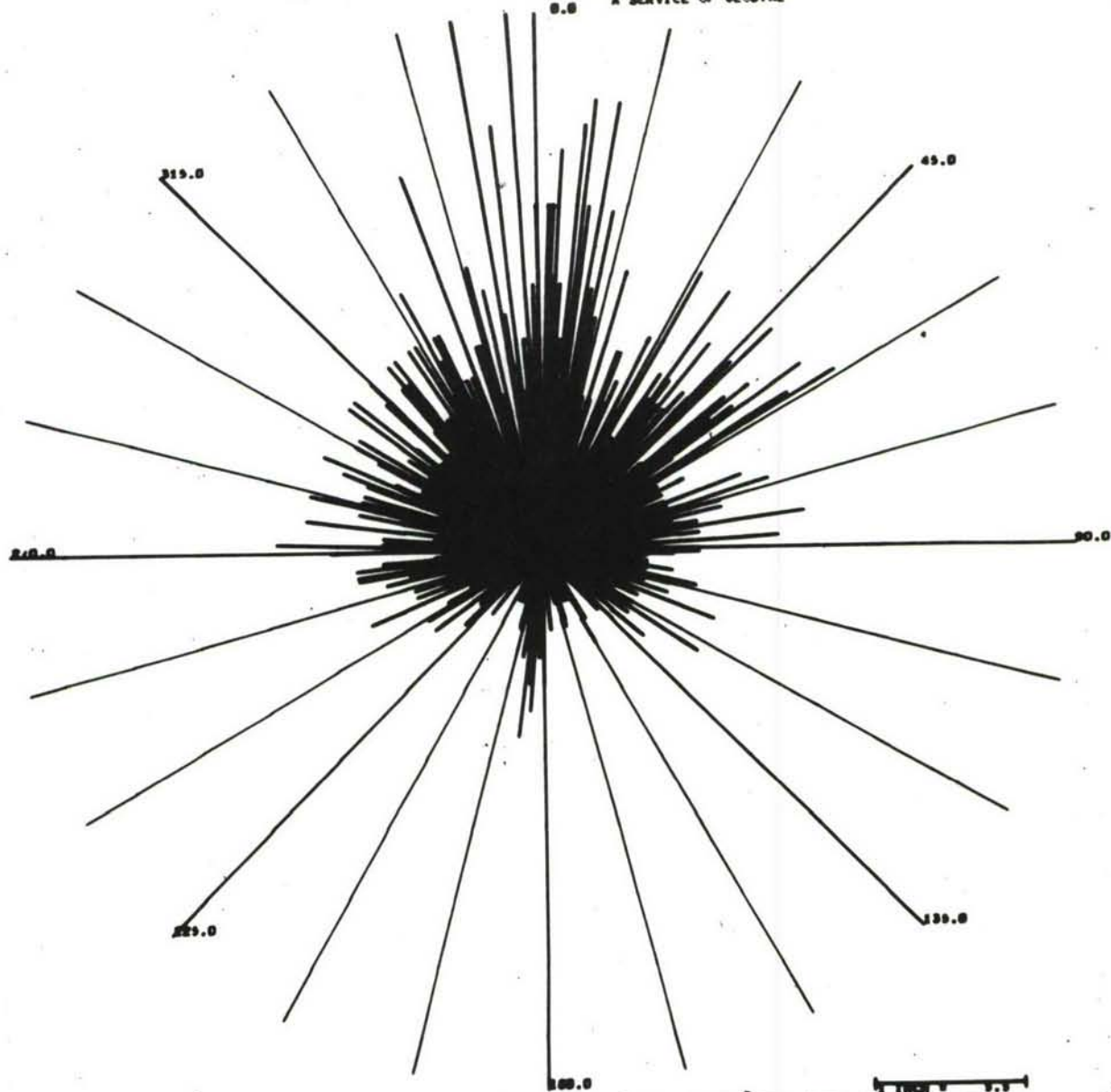
1800

3 NOV.  
0000





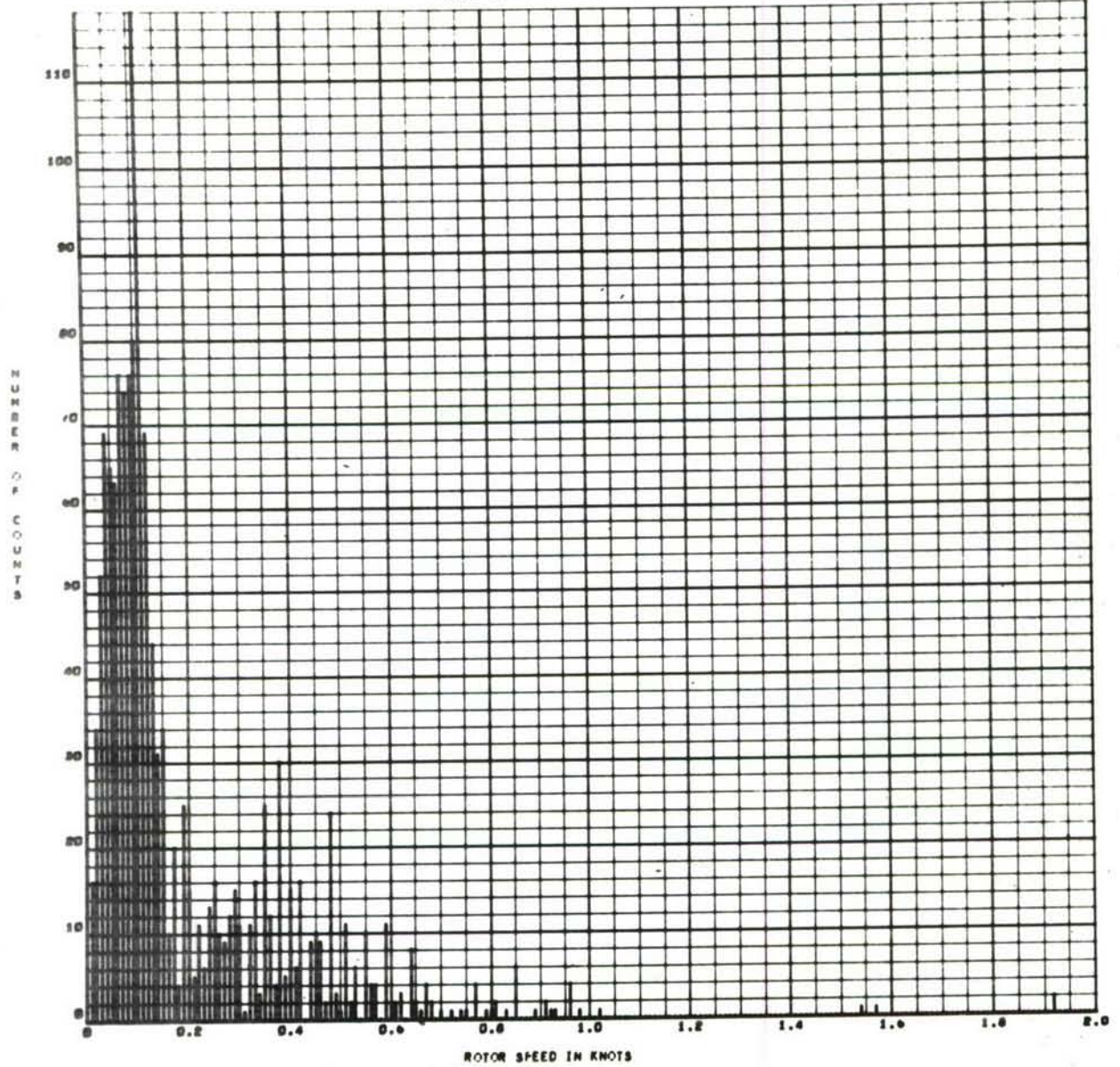




SITE 7C. POLAR COORDINATE HISTOGRAM 4053 FOOT DEPTH  
(27 FEET ABOVE BOTTOM) OCTOBER—NOVEMBER 1966

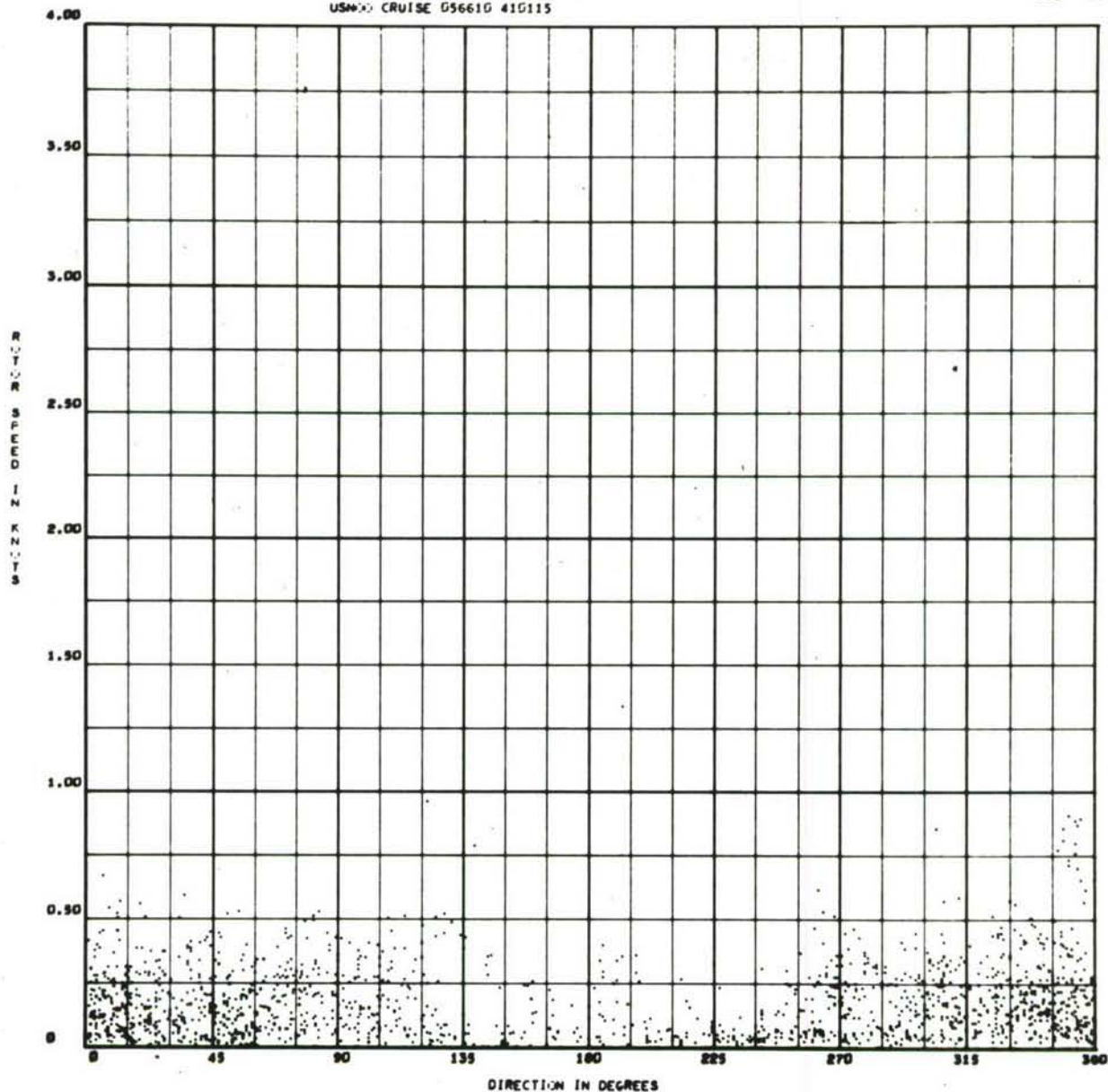
# HISTOGRAM OF ROTOR SPEED

130 020



SITE 7C. HISTOGRAM OF ROTOR SPEED 4053 FOOT DEPTH  
(27 FEET ABOVE BOTTOM) OCTOBER—NOVEMBER 1966





SITE 7C. SCATTER PLOT 4053 FOOT DEPTH  
(27 FEET ABOVE BOTTOM) OCTOBER—NOVEMBER 1966

TITLE: FILM PROCESSING AND READING LOG\*

410113

## FILM IDENTIFICATION BY CUSTOMER

Date 9 January 1967

Geodyne Assigned Film No.

Name ~~XXXXXXXXXX~~ Thomas G. LongAddress Naval Oceanographic OfficeWashington D.C. 20390

G 463-9B

Customer's film identification

Type of Instrument A-100 Current Meterand Serial No. G 463

Motor RPM \_\_\_\_\_, Film Advance Speed \_\_\_\_\_

No. Timer Cam Lobes 6☐ Continuous or, ☒ Interval Record,Time Interval Between Records 5 SecondsCruise 056610, Location: Lat. 32° 48.3'N Long. 118° 20.1'W Meter Depth 12 feetMagnetic variation (+ = East, - = West) 14° 26' East

above bottom

Recording started at 0946 Hours, plus 8 Time Zone, 25 Oct 1966 DateRecording ended at 1130 Hours, plus 8 Time Zone, 22 Nov 1966 Date

Comments:

S t ion 9 Bravo, Water depth 300 feet

## INSTRUCTIONS TO GEODYNE

Store at Geodyne or send to:

☐ Process original film, ☐ 100', ☐ 150'Naval Oceanographic Office☐ Print for hand reading (clear edge)Washington D.C. 20390☐ Print for automatic " (dark edge)Attn: Ronald Kopenski, Code 9100☒ Analog strip chart record☒ Magnetic tape record

Other instructions:

1. Process only that data between tape strips on film.
2. Supply plots of direction versus time and speed versus time.
3. Supply scatter plots and histogram plots.

Customer's Order No. ⑧

## FILM AND READING EVALUATION BY GEODYNE

Record started: foot mark 6602+23 @ \_\_\_\_\_ hours, \_\_\_\_\_ DateRecord ended: foot mark 6644+35 @ \_\_\_\_\_ hours, \_\_\_\_\_ DateTotal footage 42' + 12', Total elapsed time of record \_\_\_\_\_

FILM EVALUATION: Alignment \_\_\_\_\_, Density \_\_\_\_\_

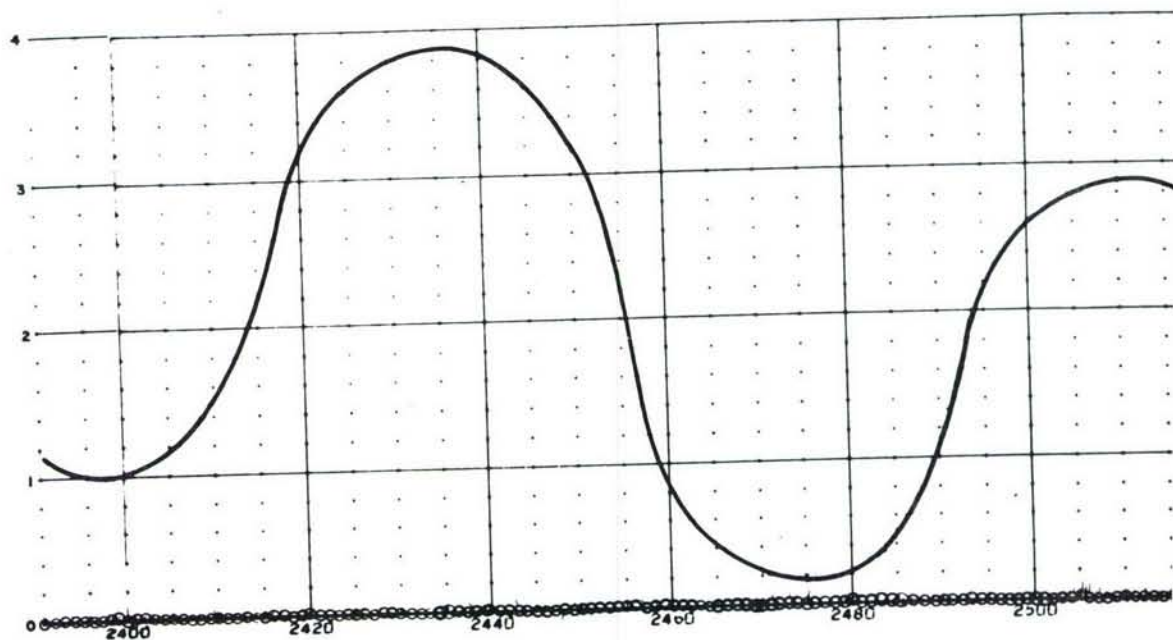
Compass \_\_\_\_\_, Vane \_\_\_\_\_, Rotor \_\_\_\_\_, Time pulse \_\_\_\_\_

Comments:

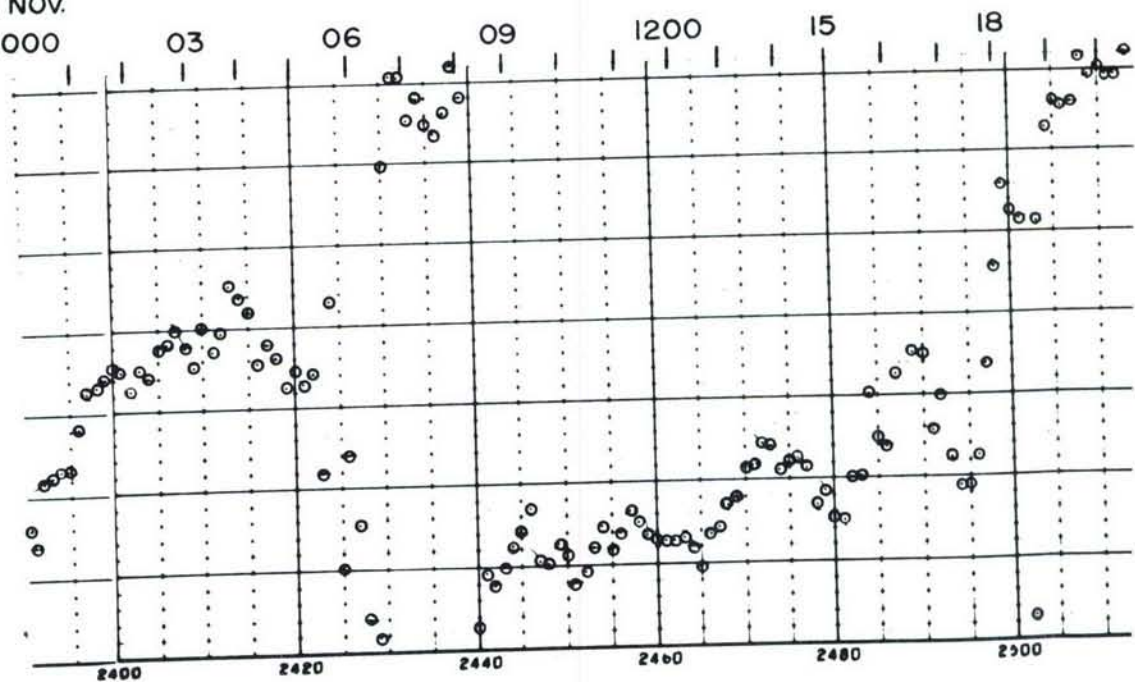
Strip Chart:

Magnetic Tape: 000 519 Part 3Date Completed: Film Processing \_\_\_\_\_, Reading 3-14-67

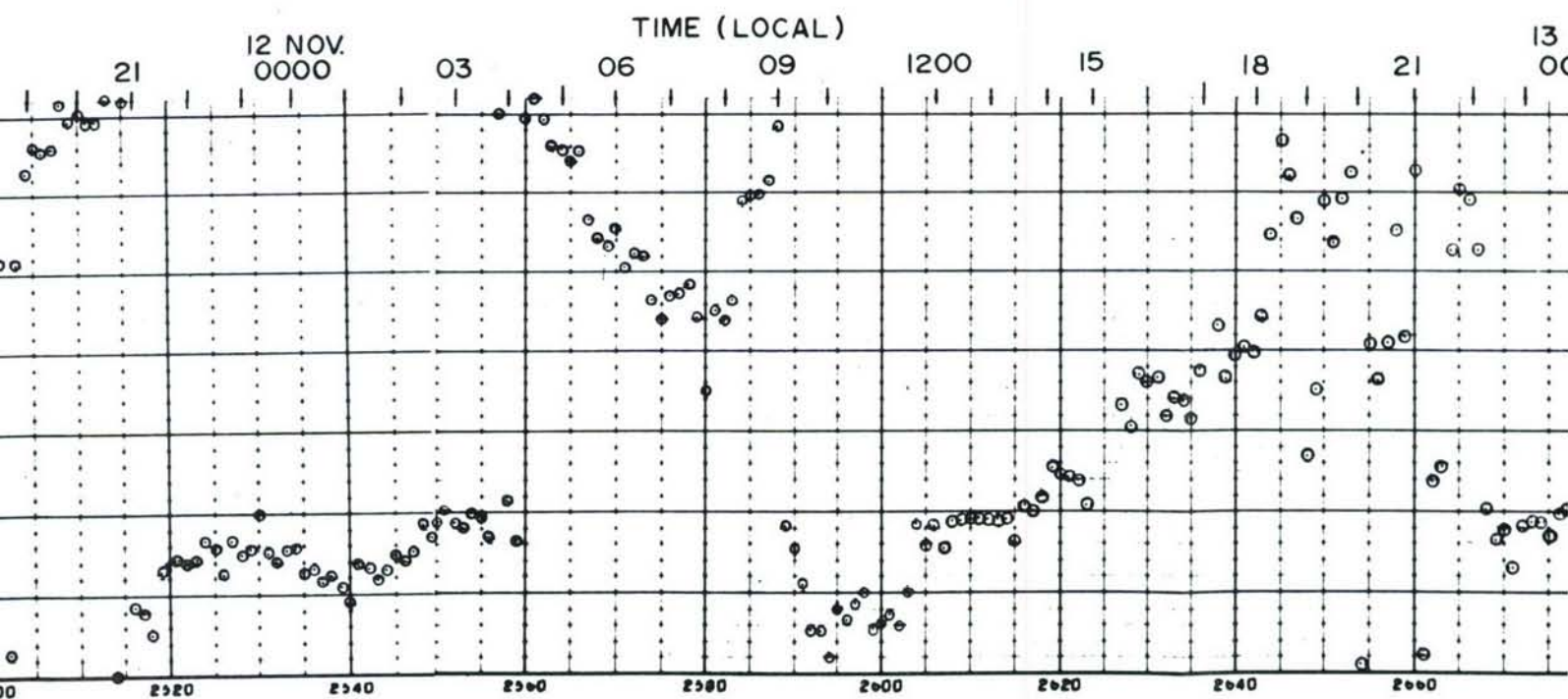
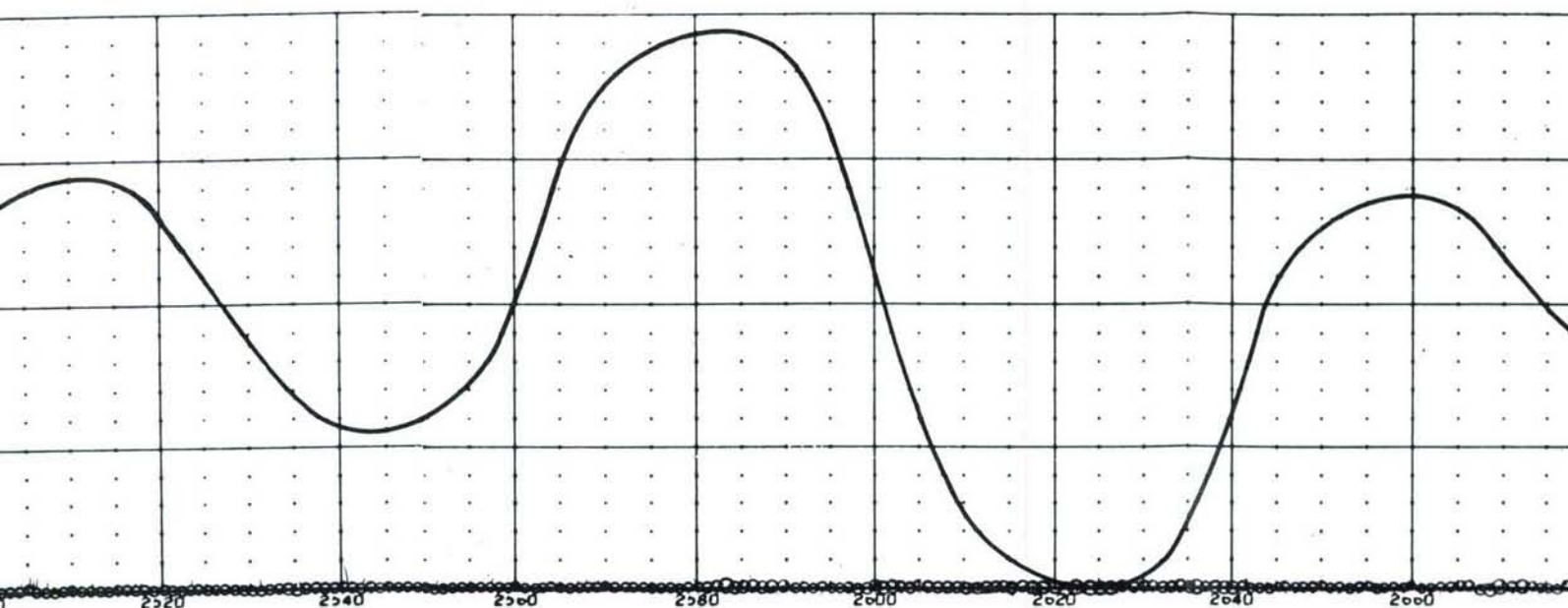
SITE 9B. DATA SHEET—288 FOOT DEPTH (12 FEET ABOVE  
BOTTOM) OCTOBER—NOVEMBER 1966

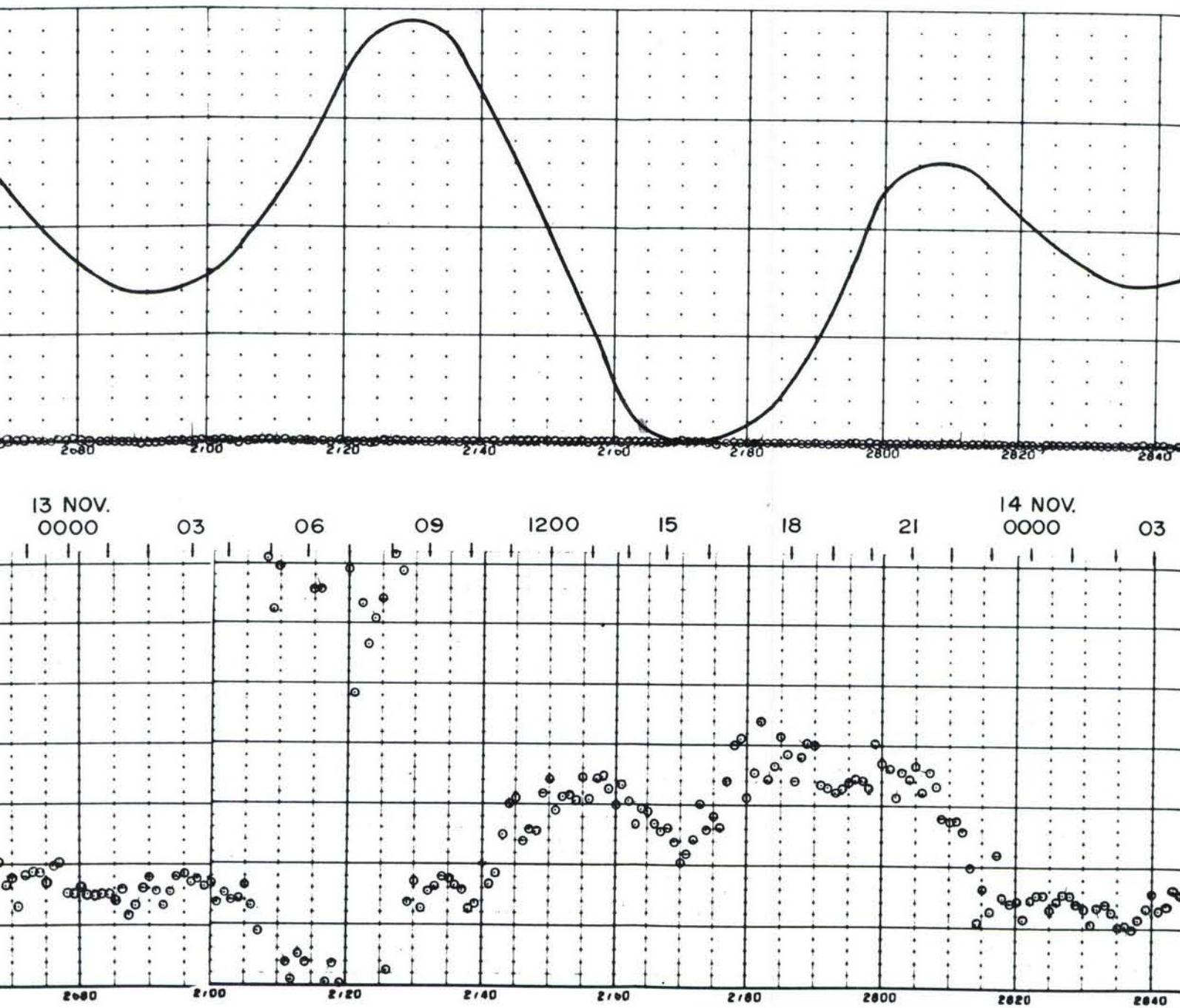


11 NOV.  
0000

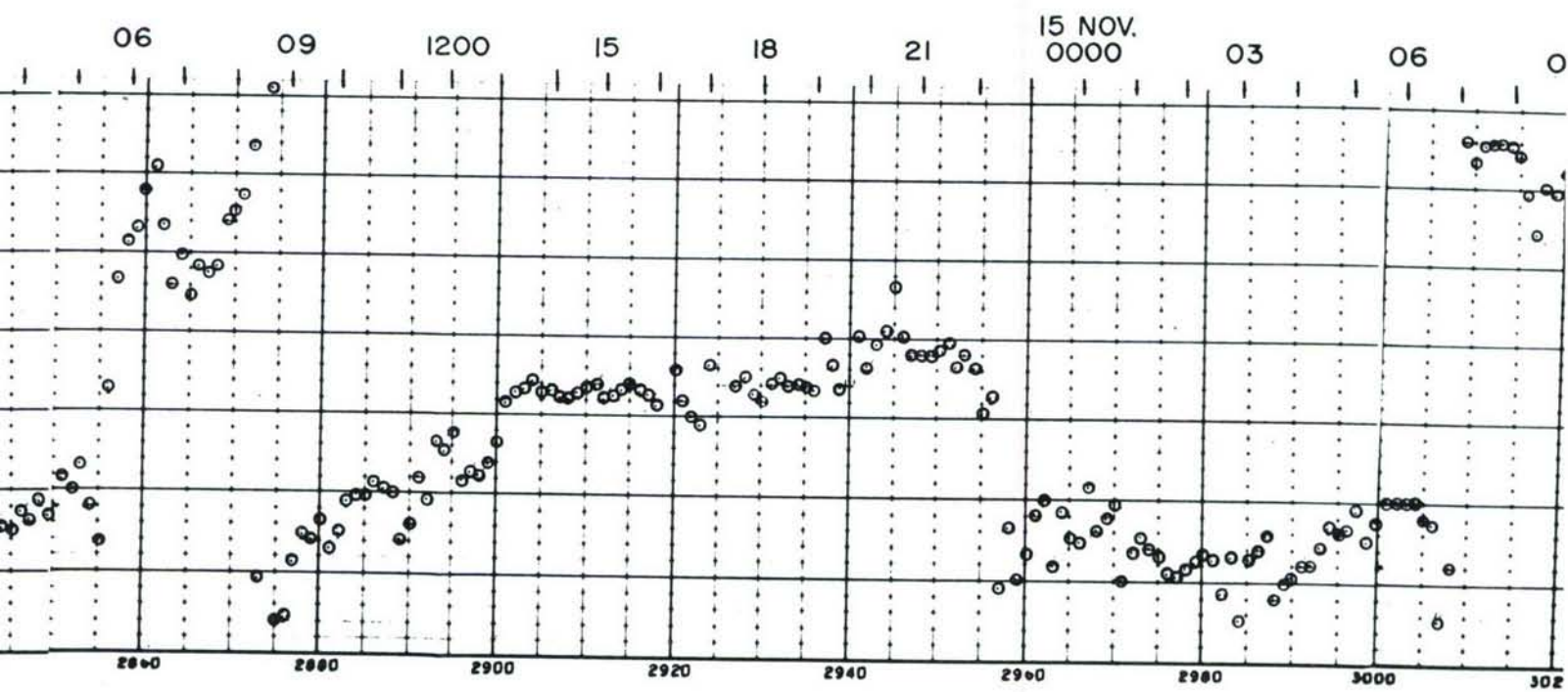
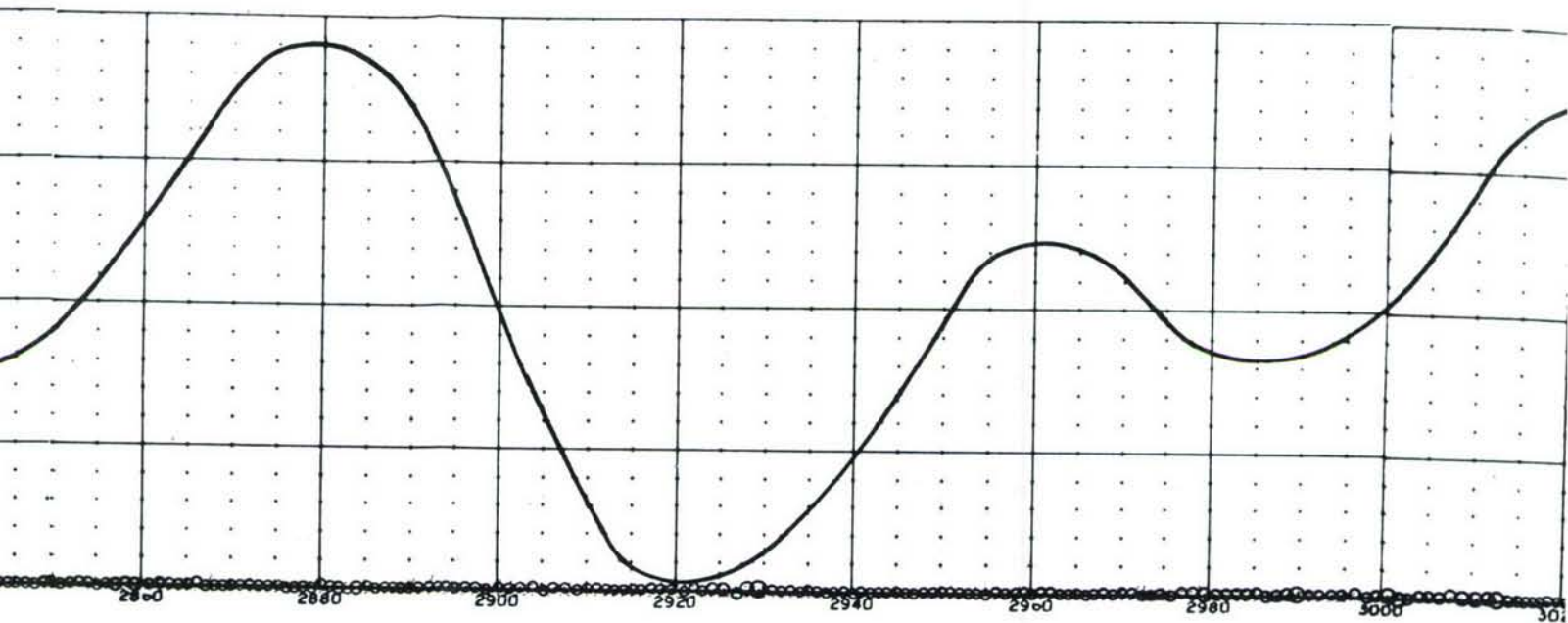




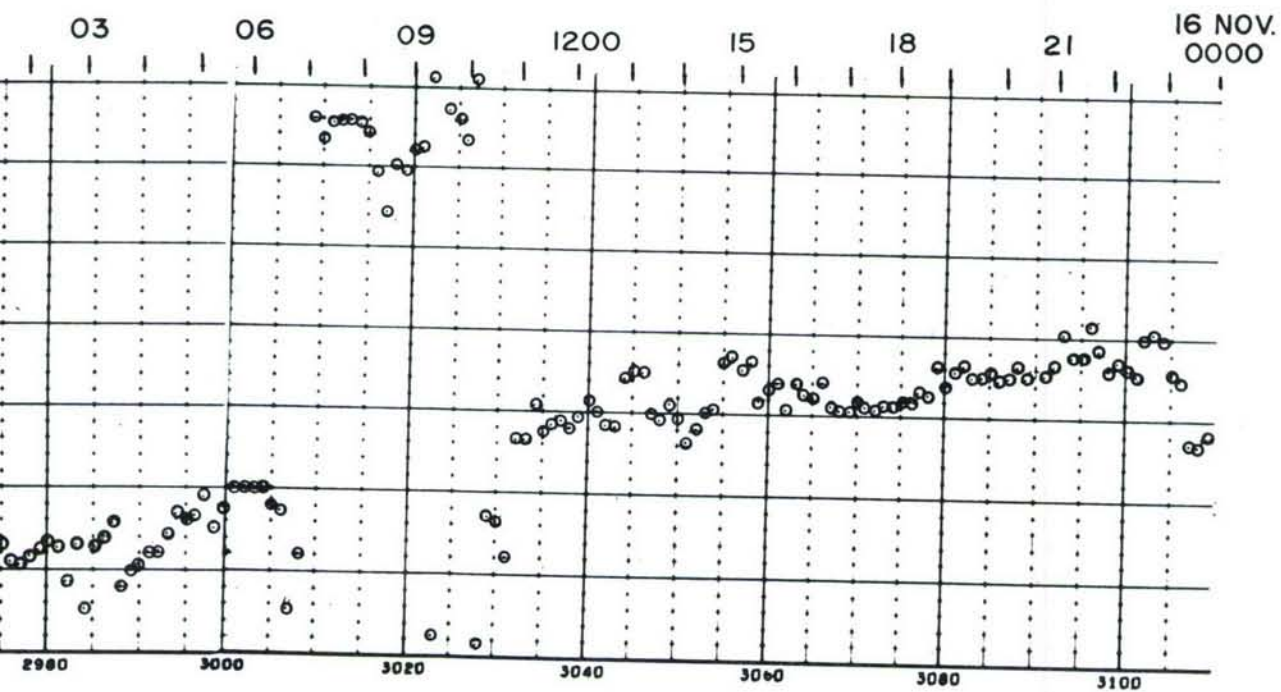
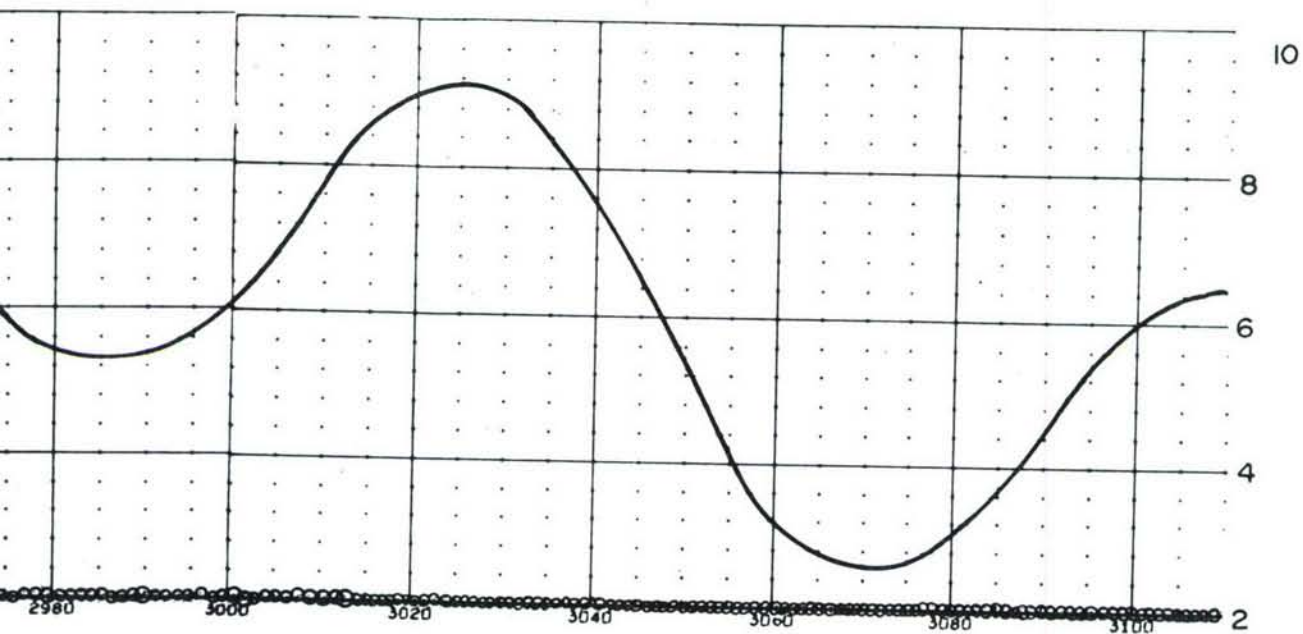


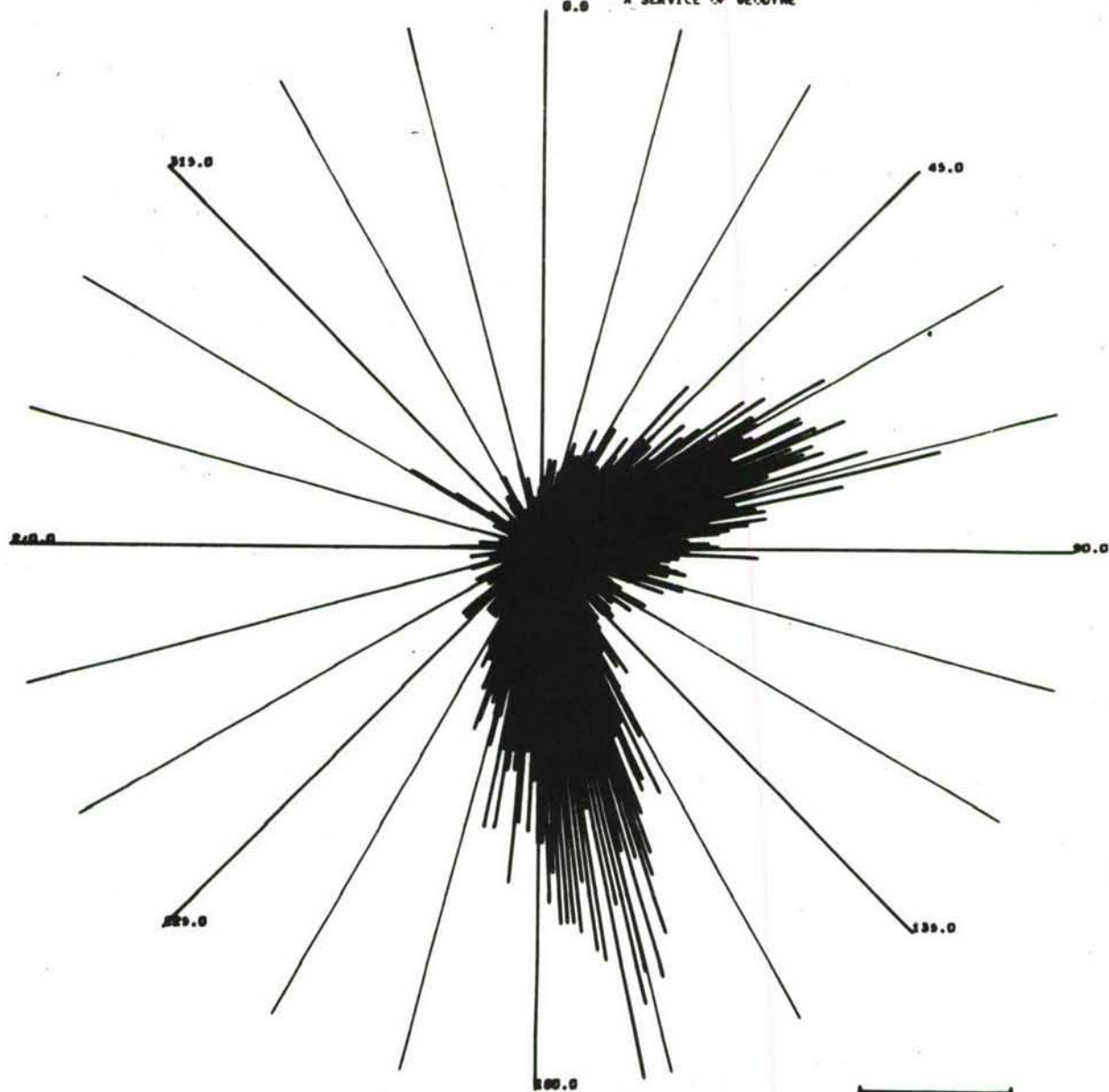


SITE 9B. CURRENT METER RECORD AND TIDE HEIGHT—5 DAY RECORD—288 FOOT DEPTH (12 FEET ABOVE BOTTOM)





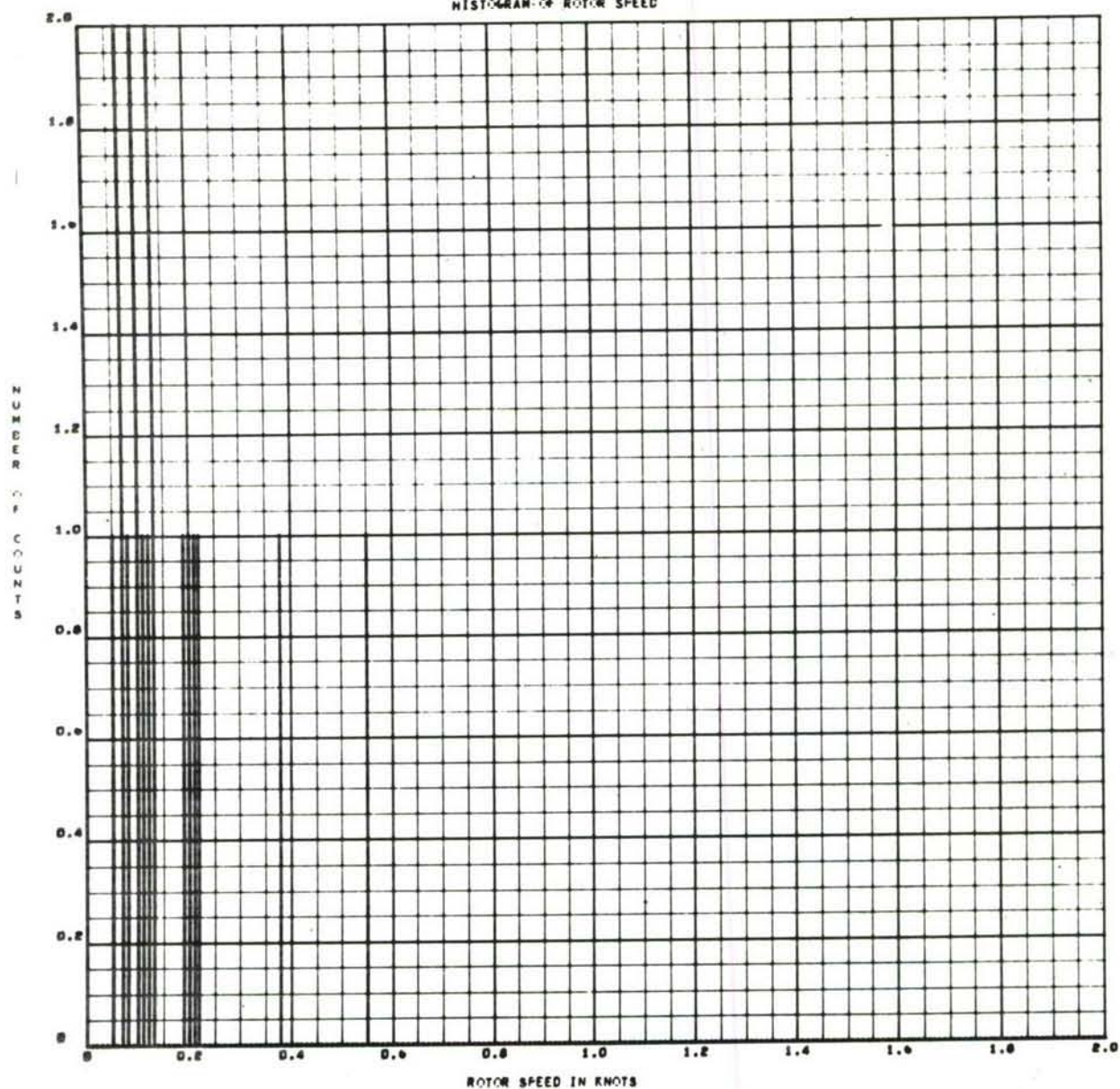




SITE 9B. POLAR COORDINATE HISTOGRAM 288 FOOT DEPTH  
(12 FEET ABOVE BOTTOM) OCTOBER—NOVEMBER 1966

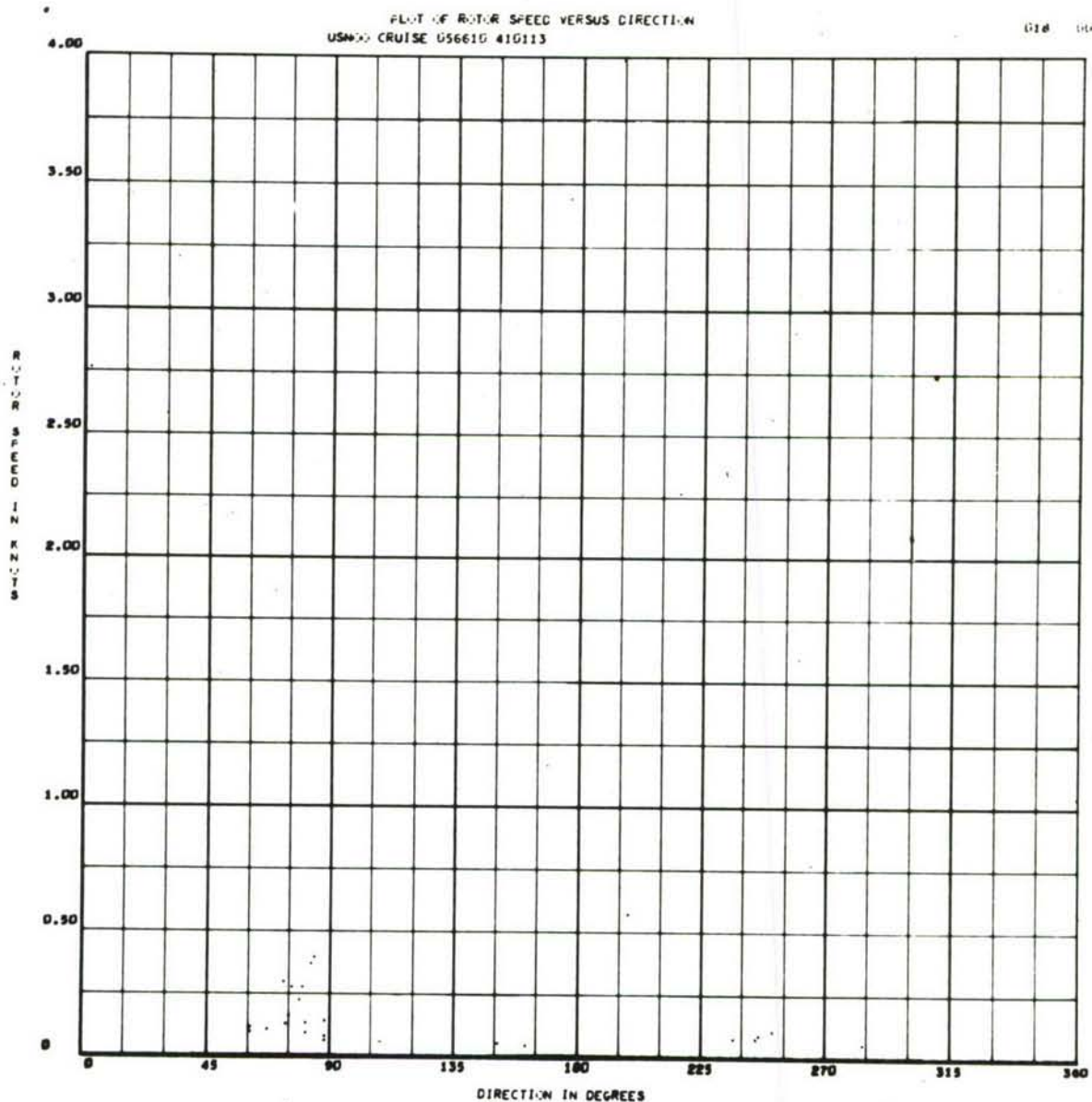
## HISTOGRAM OF ROTOR SPEED

098 028



SITE 9B. HISTOGRAM OF ROTOR SPEED 288 FOOT DEPTH  
(12 FEET ABOVE BOTTOM) OCTOBER—NOVEMBER 1966





SITE 9B. SCATTER PLOT 288 FOOT DEPTH  
(12 FEET ABOVE BOTTOM) OCTOBER—NOVEMBER 1966

TITLE: FILM PROCESSING AND READING LOG\*

410 112

## FILM IDENTIFICATION BY CUSTOMER

Date 9 January 1967

Geodyne Assigned Film No.

Name ~~XXXXXXXXXXXX~~ Thomas G. LongAddress Naval Oceanographic OfficeWashington D.C. 20390

228-11C

Customer's film identification

Type of Instrument

and Serial No. 228

Motor RPM \_\_\_\_\_, Film Advance Speed \_\_\_\_\_

No. Timer Cam Lobes 6☐ Continuous or, ☒ Interval Record,Time Interval Between Records 5 SecondsCruise 056610, Location: Lat. 32° 28.4'N Long. 118° 06.4'W Meter Depth 12 feetMagnetic variation (+ = East, - = West) 14° 26' East

above bottom

Recording started at 1353 Hours, plus 8 Time Zone, 16 Nov 1966 DateRecording ended at 0830 Hours, plus 8 Time Zone, 9 Dec 1966 Date

Comments:

Station 11 C, Water depth 6078 feet

## INSTRUCTIONS TO GEODYNE

Store at Geodyne or send to:

☐ Process original film, ☐ 100', ☐ 150'Naval Oceanographic Office☐ Print for hand reading (clear edge)Washington D.C. 20390☐ Print for automatic " (dark edge)Attn: Ronald Kopenski, Code 9100☒ Analog strip chart record☒ Magnetic tape record

Other instructions:

1. Process only that data between tape strips on the film.
2. Supply plots of direction versus time and speed versus time.
3. Supply scatter plots and histogram plots.

Customer's Order No. (9)

## FILM AND READING EVALUATION BY GEODYNE

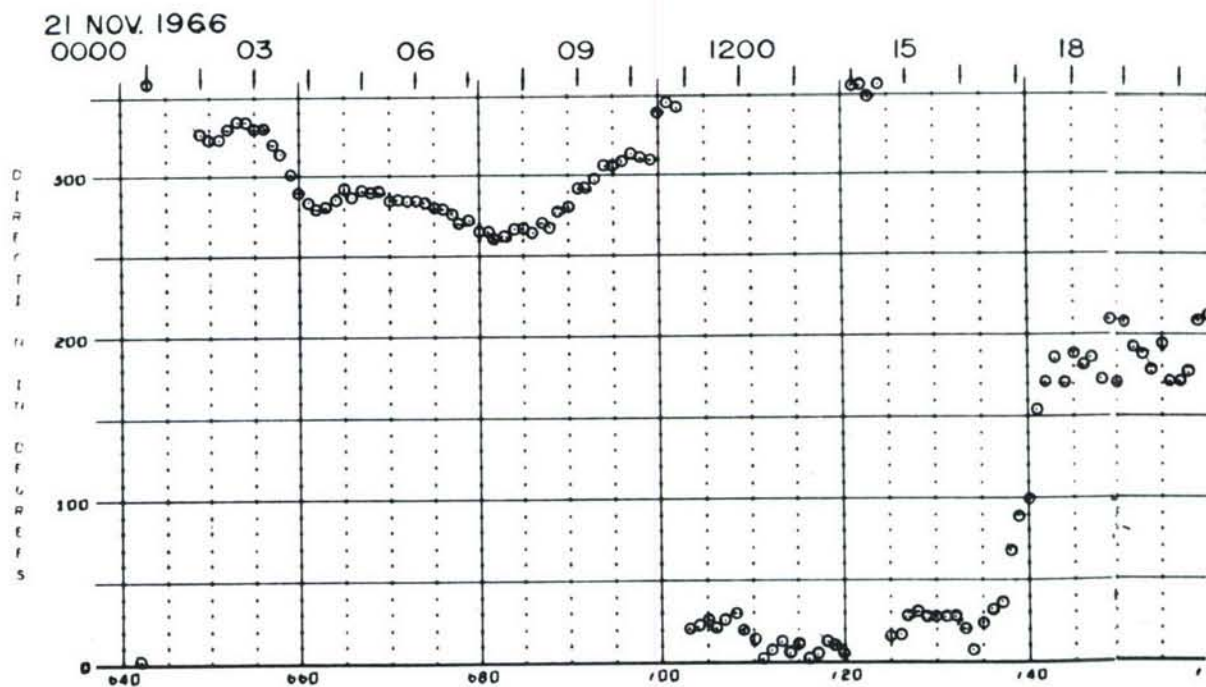
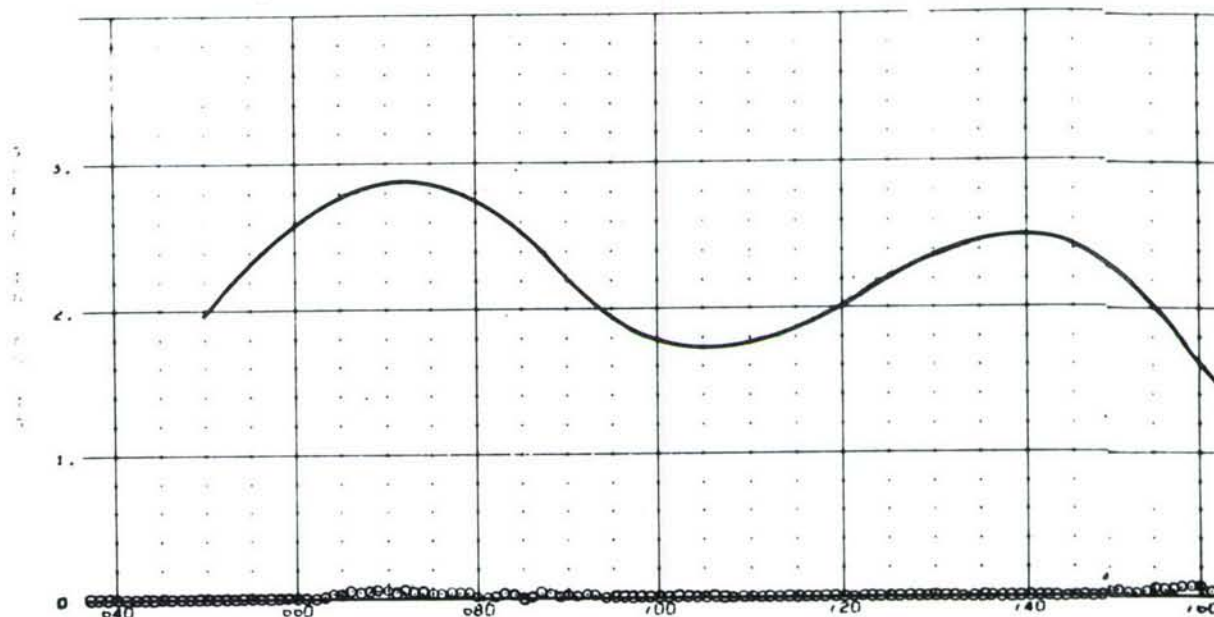
Record started: foot mark 6555 + 25 @ \_\_\_\_\_ hours, \_\_\_\_\_ DateRecord ended: foot mark 6589 + 1 @ \_\_\_\_\_ hours, \_\_\_\_\_ DateTotal footage 33' + 16', Total elapsed time of record \_\_\_\_\_

FILM EVALUATION: Alignment \_\_\_\_\_, Density \_\_\_\_\_

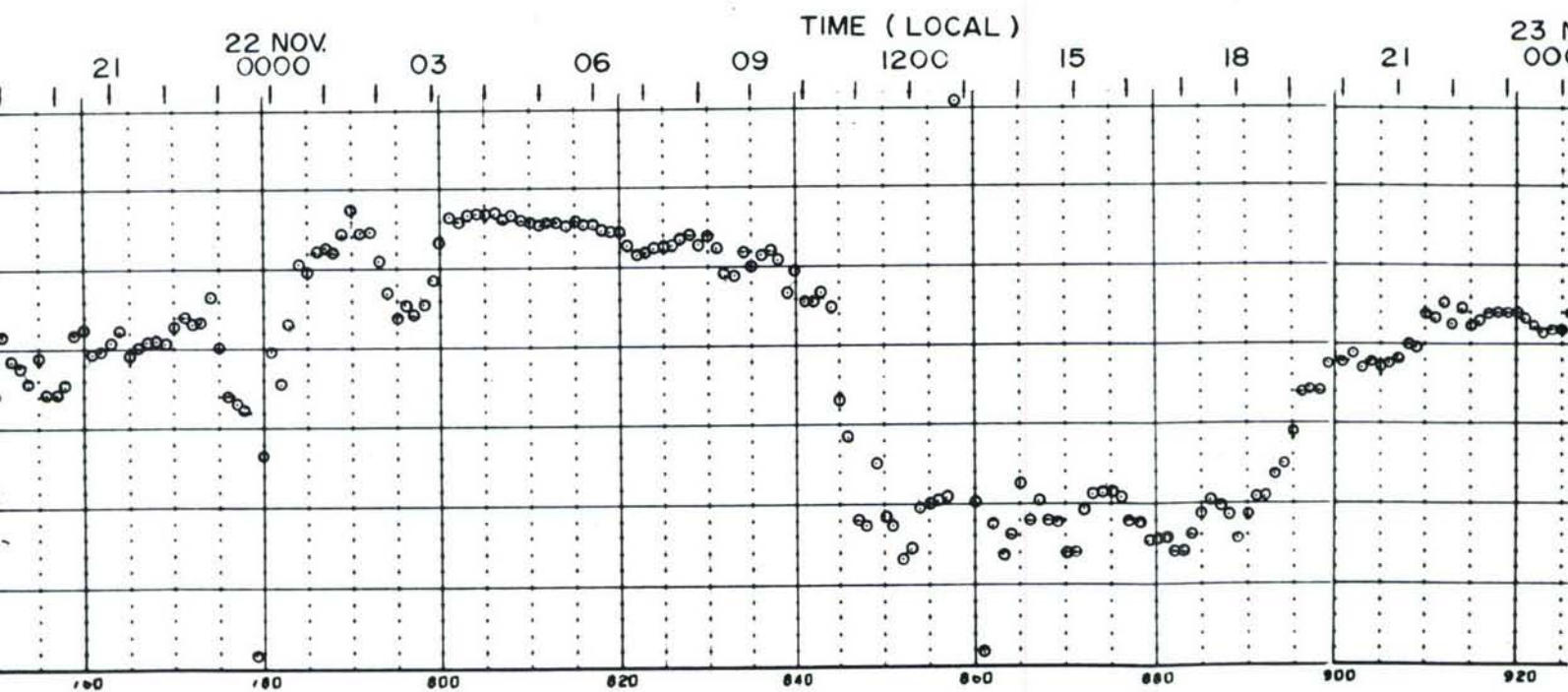
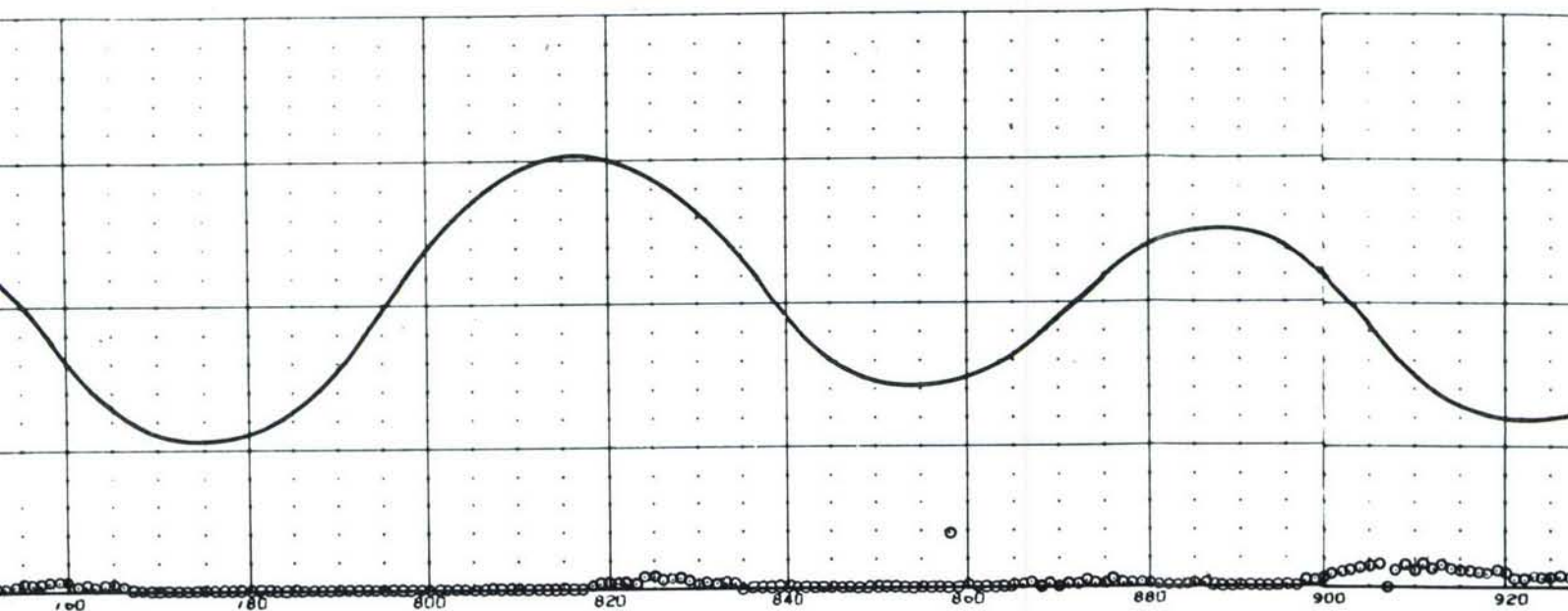
Compass \_\_\_\_\_, Vane \_\_\_\_\_, Rotor \_\_\_\_\_, Time pulse \_\_\_\_\_

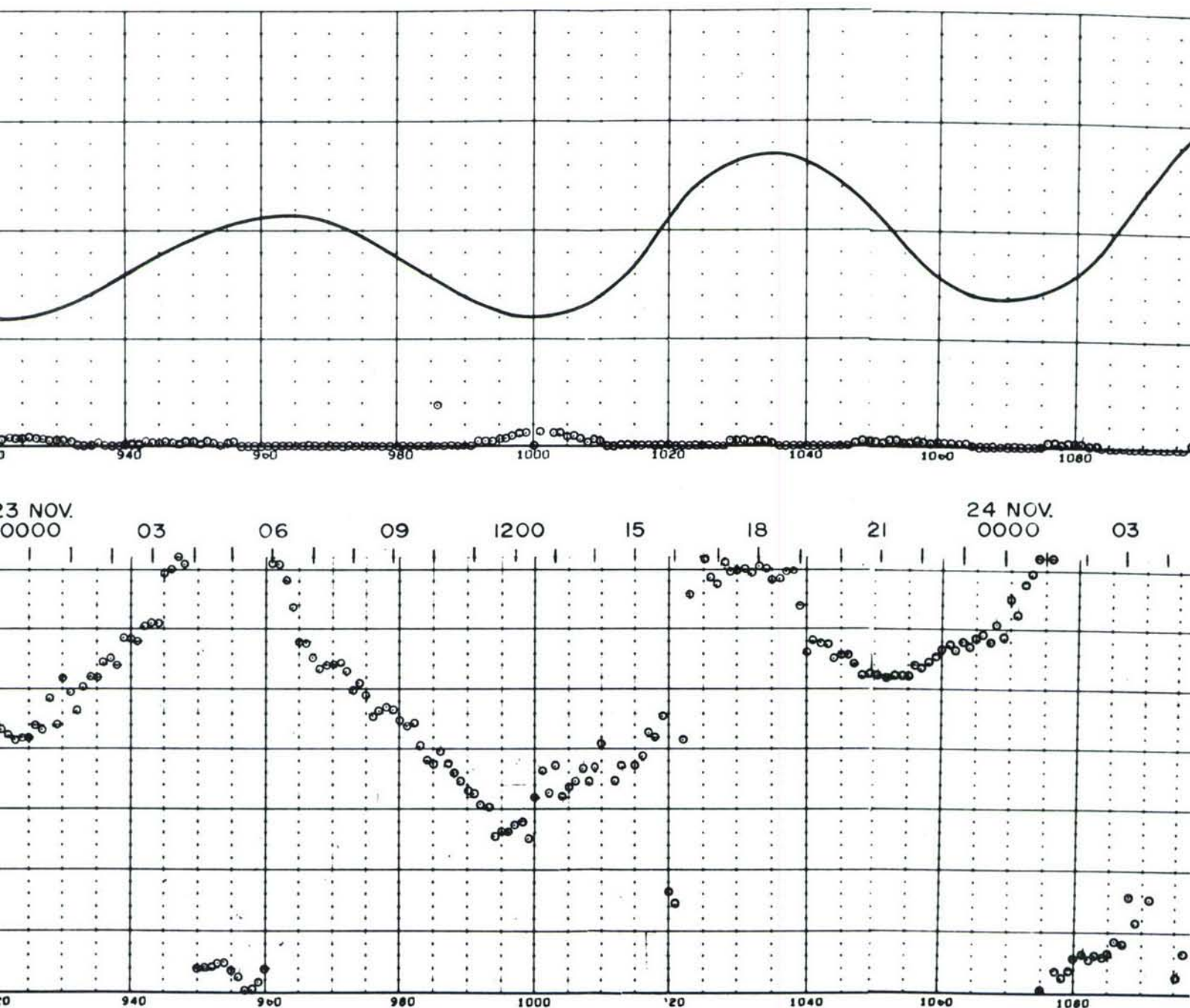
Comments:

Strip Chart: ContinuousMagnetic Tape: 000519 Part 2Date Completed: Film Processing \_\_\_\_\_, Reading 3-14-67SITE 11C. DATA SHEET—6066 FOOT DEPTH (12 FEET ABOVE  
BOTTOM) NOVEMBER—DECEMBER 1966

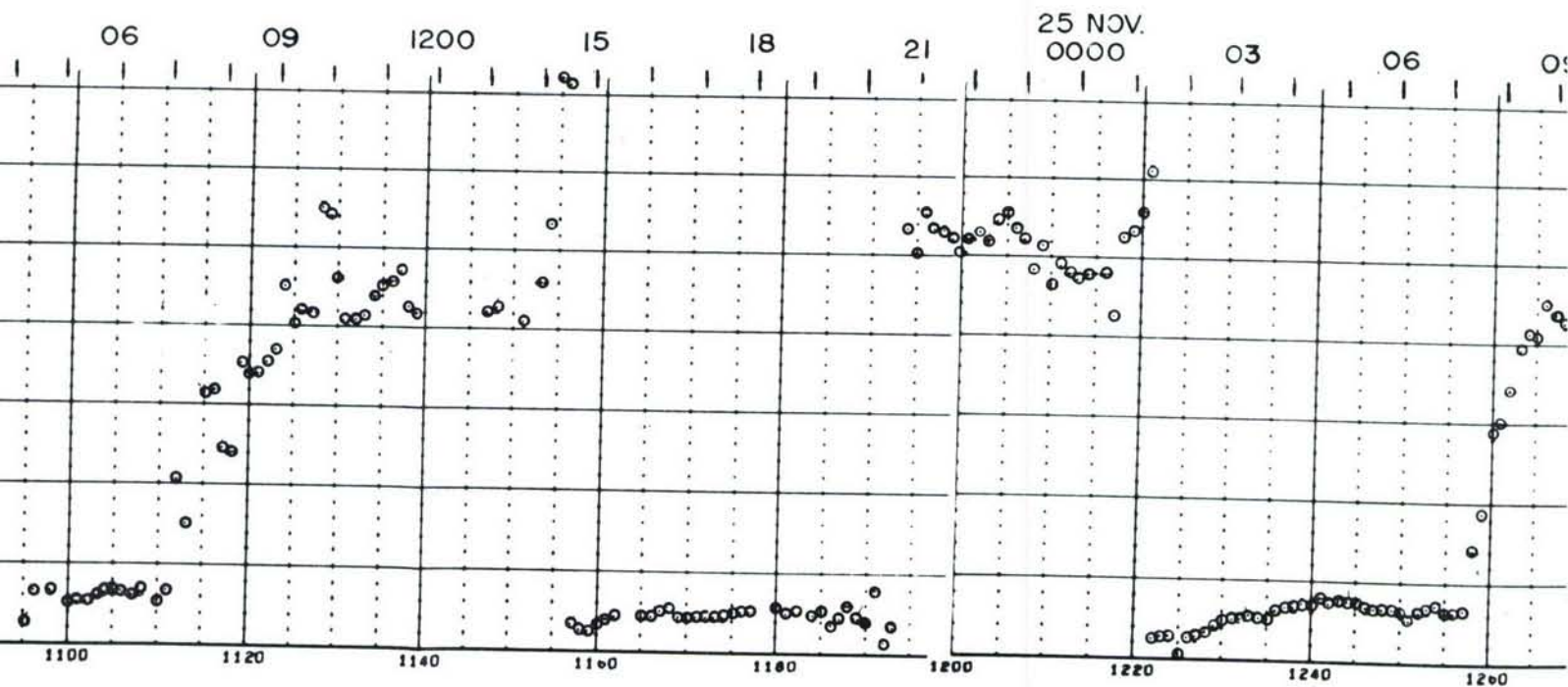
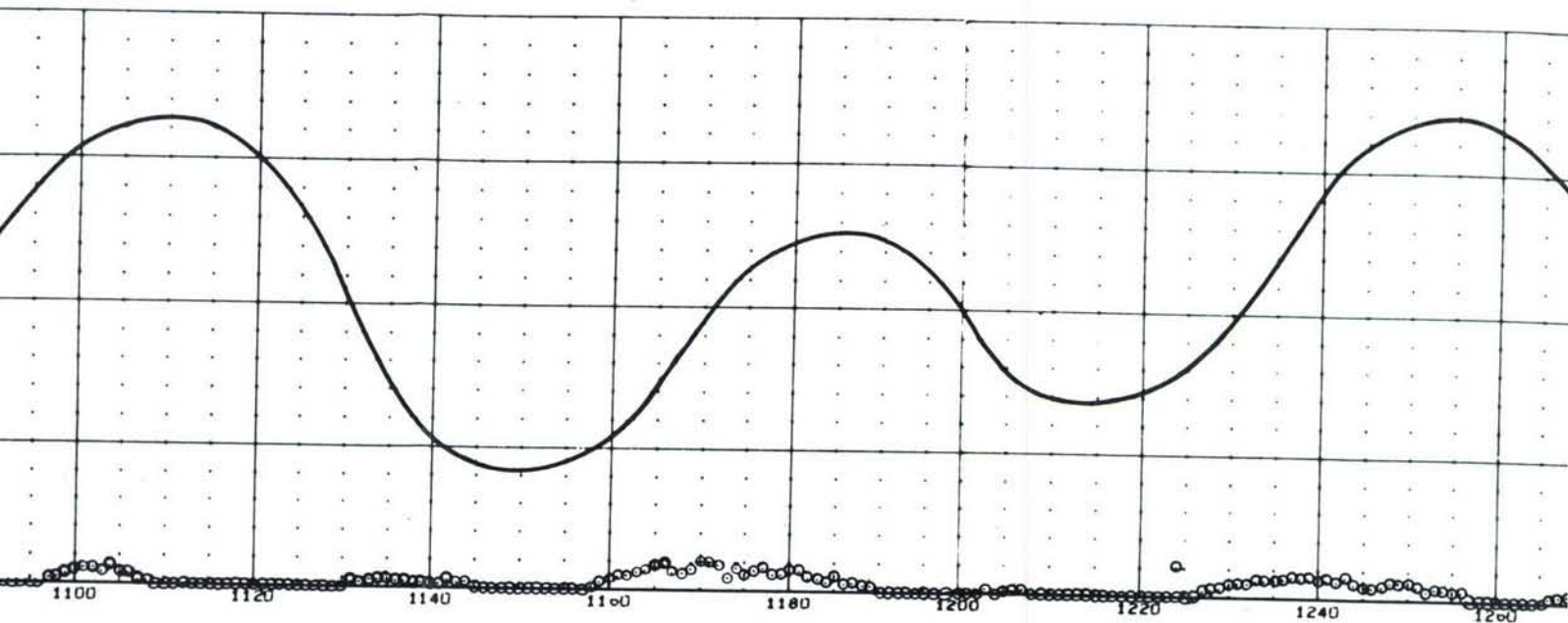




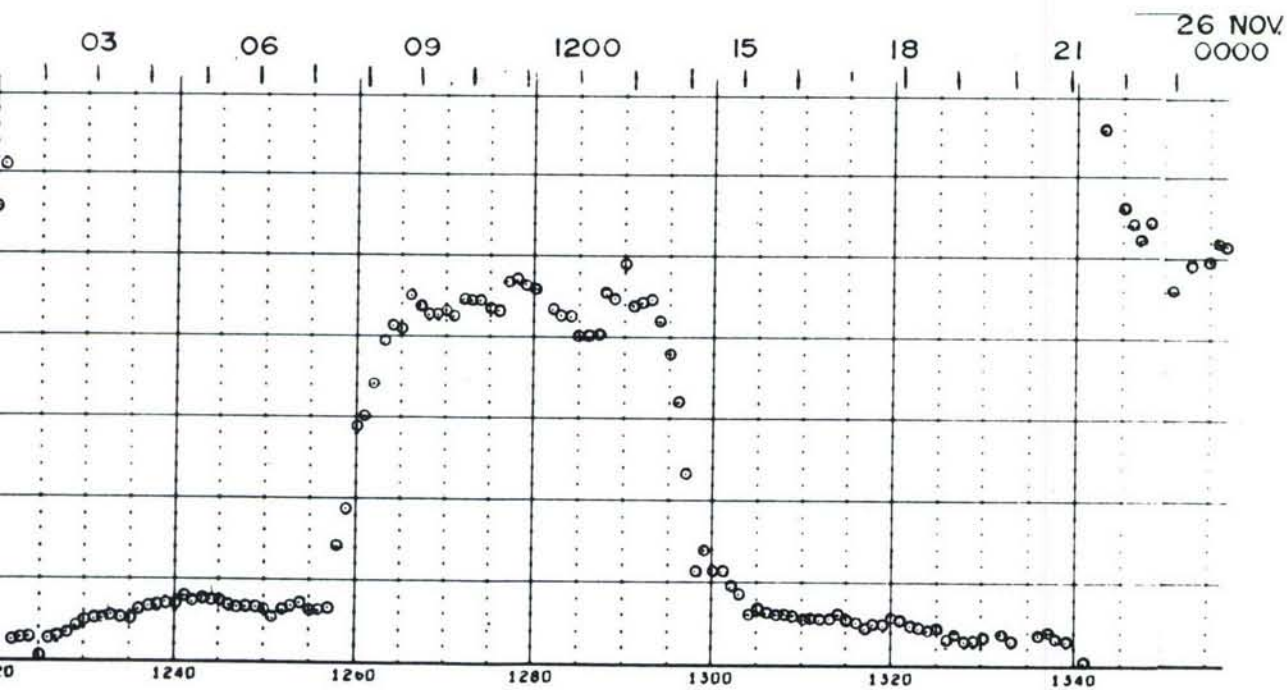
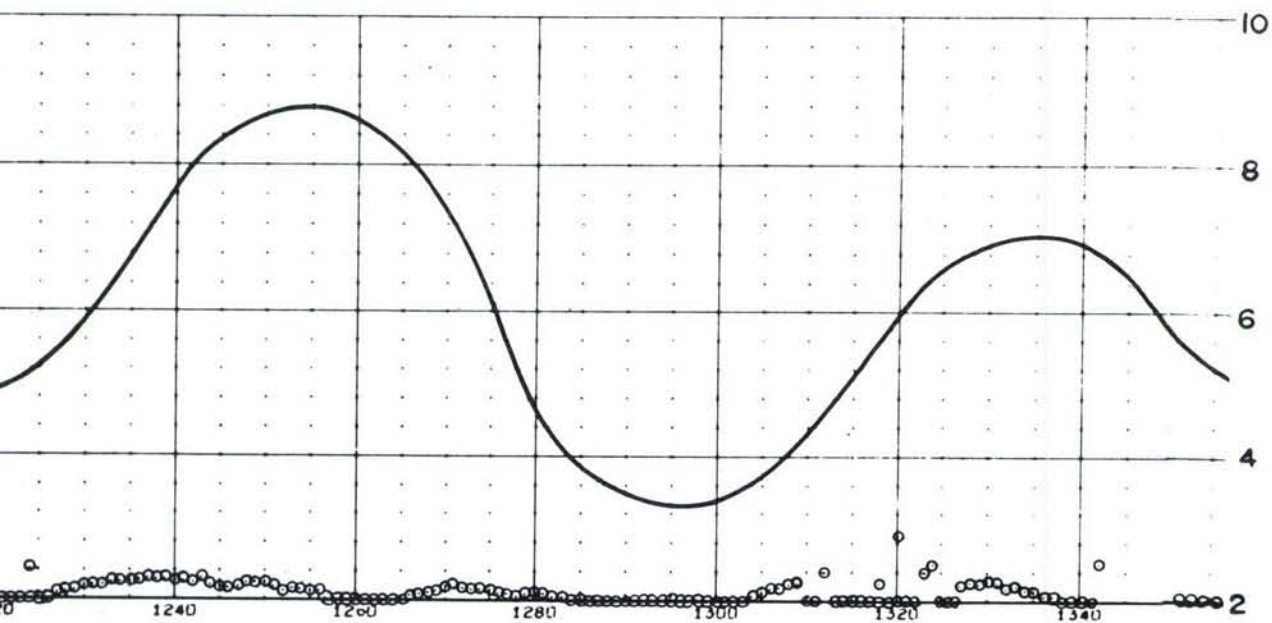


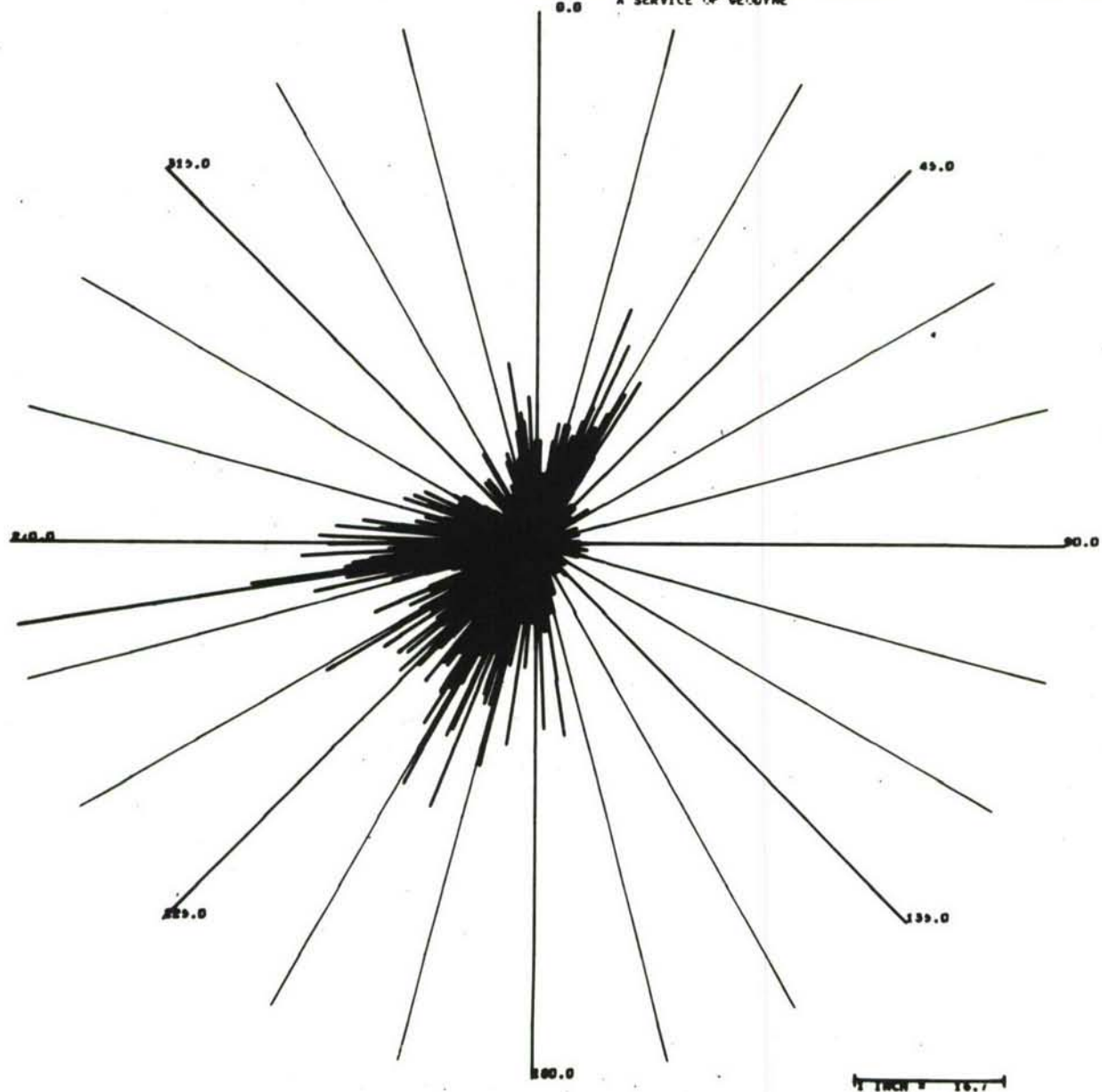


SITE 11C. CURRENT METER RECORD AND TIDE HEIGHT—5 DAY RECORD—6066 FOOT DEPTH (12 FEET ABOVE BOTTOM)





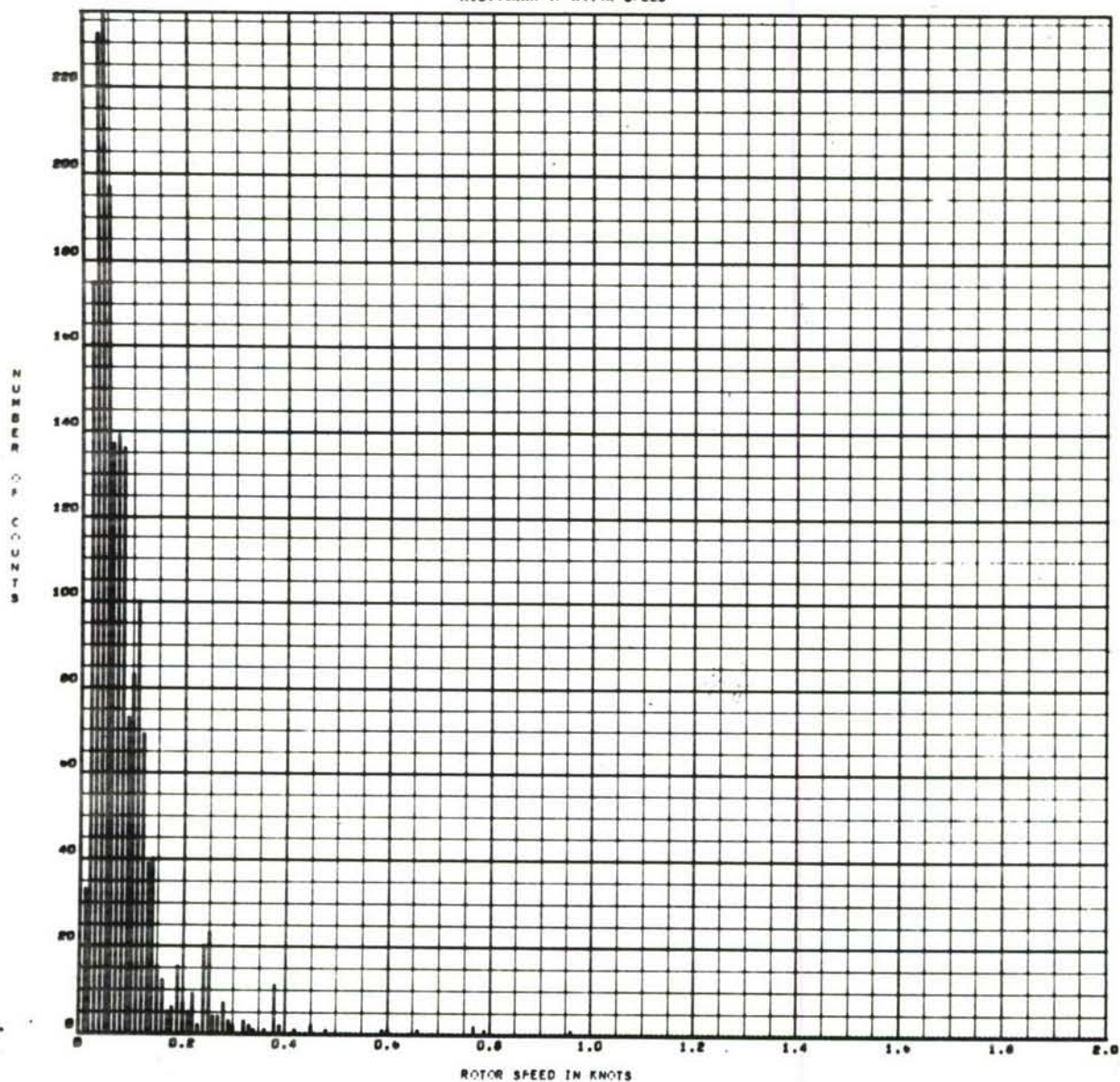




SITE 11C. POLAR COORDINATE HISTOGRAM 6066 FOOT DEPTH  
(12 FEET ABOVE BOTTOM) NOVEMBER—DECEMBER 1966

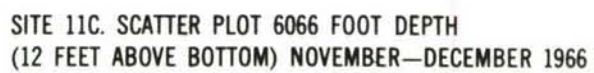
## HISTOGRAM OF ROTOR SPEED

063 020



SITE 11C. HISTOGRAM OF ROTOR SPEED 6066 FOOT DEPTH  
(12 FEET ABOVE BOTTOM) NOVEMBER—DECEMBER 1966





APPENDIX C

GLOSSARY OF OCEANOGRAPHIC TERMS

## GLOSSARY OF TERMS

- Alpha meter (Transmissometer) - An instrument which measures the optical attenuation coefficient of an in-situ water sample.
- Basin - A depression of the sea floor more or less equidimensional in form and of variable extent. When the length is much greater than the width, the feature is called a trough.
- Benthic - Pertaining to all submarine bottom terrain regardless of water depth.
- Clastic Sediments - A rock composed of debris transported mechanically into its place of final deposition. Sandstones and shales are the most common clastics.
- Continental Borderland - A region adjacent to a continent, normally occupied by the Continental Shelf, which is highly irregular with depths well in excess of those typical of Continental Shelves.
- Continental Shelves - Zones adjacent to a continent or around an island, and extending from the low water line to the depth at which there is usually a marked increase of slope to greater depth.
- Continental Slope - A declivity seaward from a shelf edge into greater depth.
- Dome - An elevation rising less than 500 fathoms from the sea floor, and of limited extent across the summit.
- Fault Escarpment - An elongated and comparatively steep slope of the sea floor, separating flat gently sloping areas.
- Fines - The silt and clay fraction of a sediment.



- Clauconite - A green mineral, closely related to the micas and essentially a hydrous potassium iron silicate. Occurs in sediments of marine origin.
- High Water - The maximum height reached by a rising tide.
- K-Meter - An instrument which measures the upwelling and downwelling light in the ocean environment.
- Low Water - The minimum height reached by a falling tide.
- Mixed Tide - Type of tide in which a diurnal wave produces large inequalities in heights and/or durations of successive high and/or low waters.
- Organic Sediment - Biological matter which accumulates in a loose unconsolidated form.
- Pelagic - A division of the ocean which includes the whole water mass.
- Phosphorite - A fibrous concretionary mineral occurring in sediments of marine origin.
- Reversing Current - A tidal current that flows alternately in approximately opposite directions, with a period of slack water at each reversal of direction.
- Rotary Current - A tidal current that flows continually, with the direction of flow changing through all points of the compass during a tide cycle.
- Sedimentation - The process of breakup and separation of particles from the parent rock, their transportation, deposition, and consolidation into another rock.
- Semi-diurnal - Having a period or cycle of approximately half a lunar day (12.42 solar hours).
- Tectonic - Pertains to the origin and development of the structural features of the earth's crust.
- Terrigenous - Formed by the erosive action of rivers, tides, and currents.

Transducer - A device that converts electrical energy to sound energy, or the converse.

Turbidity Current - A highly turbid, relatively dense current, carrying large quantities of clay, silt, and sand in suspension which flows down a submarine slope through less dense sea water.

UNCLASSIFIED

Security Classification

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(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

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2b. GROUP

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4. DESCRIPTIVE NOTES (Type of report and inclusive dates)

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12. SPONSORING MILITARY ACTIVITY

U. S. Naval Oceanographic Office

13. ABSTRACT

This report presents sediment, deep towed profiler, physical oceanography, visibility, and current data collected in the San Clemente Island Test Range from October to December 1966 aboard the USNS DAVIS (T-AGOR 5). The sediments vary in size from clays to sand and the bearing strength ranges from 0.8 g/cm<sup>2</sup> near the tops of several cores to 58.7 g/cm<sup>2</sup> for near the bottom of one of the longer cores (80-87cm interval). The deep towed profiler traces show hillocks six feet in height and subbottom reflecting layers from 3 to 50 feet below the sediment surface. Sea water temperature values range from 18.5°C at the surface to 2.85°C at 1483 meters depth in San Clemente Basin. Minimum sound velocity values for the area occur between 700 and 800 meters depth. Alpha values for the water column range from 0.03 ln/m (150-200 meters depth) to 0.28 ln/m (30-40 meters depth). This represents visibility ranges from about 130 meters to 14 meters respectively. Tidal forces appear to exert an influence on the current regime to the greatest depth measured (1829 meters). Current speeds for the water column range from zero to about 1.5 knots with rotary direction vectors. Instrumentation development pertinent to the survey is also discussed. Conclusions reached in this report are tentative based on the limited amount of survey data available. More seasonal investigations of the currents, temperature, and visibility, and more detailed measurements of sea floor topography and sediments are essential in order to clearly define the oceanographic environment.



Security Classification

14.

### KEY WORDS

LINK A

LINK B

LINK C

ROLE

WT

ROLE

WT

ROLE

WT

Physical Oceanography

UNCLASSIFIED

Security Classification